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## An Address

ON

### THE TREATMENT OF TYPHOID FEVER\*

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PREVIOUS to ten years ago typhoid fever was a hackneyed subject in Montreal, but for half a decade only isolated cases of the disease have been seen, until the recent milk-borne epidemic brought the subject again acutely to our attention, and is a painful reminder that only eternal vigilance is the price of safety.

It is not however the public health aspect of typhoid fever that I wish to speak of, but the actual care of the infected person. There is nothing much that is new in what I bring before you, but even the ventilation of a mouldy subject may be of some use.

When we ticket a case as typhoid fever, what does that imply? What is the content of the clinical picture which we thus draw for the guidance of our therapy? It is a septicæmia due to the typhoid bacillus, in which the lymphoid tissues bear the brunt of the reaction; Peyer's patches and the spleen particularly participating. It means a struggle running into weeks between the body and an invader against which at present we have no specific defence. If one were permitted to use a simile, we might compare an attack of pneumonia to a hundred yards dash, and a tuberculous infection to a five mile run, and typhoid fever to a quarter mile race which has to be run out at top speed

all the way, with often the need for a sprint near the finish.

Though typhoid fever, the disease, runs fairly true to form, the typhoid fever which each patient has will vary almost as much as will the people who have it, and age cannot wither nor custom stale its infinite variety. Though, therefore, a backbone of routine must run through our therapy, there must be here and there a rib of commonsense, projecting laterally to meet those unexpected and atypical features which the main stem does not reach.

For convenience we may consider first what may be spoken of as the plan of campaign, and second, the preparation against emergencies or counter attacks. But before commencing, may I be pardoned for again bringing up the clinical picture of the disease against which our patient is pitted. This presents the following:—

*A septicæmia.*—Typhoid bacilli are free in the circulation and their poisons have an elective affinity for parenchymatous tissues such as the nervous system, the muscles, the heart, the liver, the kidney, and other secreting glands.

*A reaction most marked in lymphoid tissue* in spleen and lymph glands, but in this disease of most importance are Peyer's patches in the small bowel and the solitary follicles in the large bowel; a reaction associated with high fever, inhibiting the organisms, but damaging to the body tissues as well.

\* Read before the Montreal Medico-Chirurgical Society, April 17, 1927.

*An immunity* only established after several weeks of infection.

*And finally our relative helplessness* in having no prepared specific antitoxin.

Confronted then by an already infected person, and having this clinical picture before us, our plan of attack, or if you prefer it of defence, will take form under these headings:

*Conservation* of the patient's natural methods of defence.

*Elimination* as far as possible of the poisoning agents.

*Reclamation* or *reconstruction* of his damaged tissues, and finally,

*Alleviation* of his discomforts, which to him indicate the real presence of his malady.

Many of the standard methods of treatment are attempts to kill two or more of these birds with one stone, *e.g.*, rest in bed accomplishes conservation and alleviation, and administration of fluids will both alleviate and eliminate.

But as regards our subject, the patient recently infected, or with his infection recently diagnosed, it goes without saying that a modern hospital offers him automatically the best surroundings for treatment; but I am taking it for granted that no such place is available, as will often happen if he is neither poor enough nor rich enough, and preparation must be made at his home in view of an illness lasting from four to eight weeks.

A single bed should be placed in the best-lighted room available; if it is too low it may be raised with blocks, and arranged with a rubber sheet and a draw sheet over a firm mattress covered by a folded blanket. An ice-bag, a feeding-cup, a urinal, and a bed-pan are the other essentials. The covering should be as light as the patient's comfort will permit. A few preliminary directions may be given: Cut the hair and put an ice bag on the head—*alleviation*; give him at least two litres of water in the twenty-four hours—*elimination*; give him a cold sponging every four hours if the temperature reaches 102.2°—*elimination* and *conservation*; and some form of nutrient fluid every two hours while awake—*reclamation and reconstruction*.

The question of food is complicated by at least four factors:—

1. The rapid wasting of body tissues, which will probably go on for weeks—nitrogen waste.

2. The diminution, and sometimes the abolition, of appetite in some stages of the disease.

3. The impairment of gastric and intestinal digestion, from poisoning of the gland tissue.

4. The risk to the ulcerated Peyer's patches from improper food.

All of which considerations demand food, *ample in caloric value reasonably attractive and assimilable and free from residue*.

A man weighing 150 lbs., or 70 kilos., will require 1800 calories per 24 hours to maintain his body-metabolism when at absolute rest. Add to this that each degree of temperature demands an additional 10 calories per kilo, making 700 more. Add to this again the loss of energy due to movement from restlessness or delirium, and we have a total of 3,000 calories *per diem* required from his food.

For a considerable period, even if soft solids can be given they cannot be swallowed, either on account of dryness of the mouth or mental torpor, and we are for a time confined to a diet of fluids or semi-fluids, and when appetite is considered we discover that sweets become ordinarily very obnoxious to a typhoid patient, and fats cannot be pushed too far on account of the difficulty of digestion. Thus our efforts at caloric feeding are frequently blocked, and unless constant supervision is maintained and adjustments made, most days will end with a debit instead of a credit balance.

A few of the props of the diet should really be memorized as to their caloric value, for instance:—

1½ quarts milk	=	1,500 c.c. contains 1,000 calories
1 pint cream	=	500 c.c. contains 1,000 calories
½ lb. sugar	=	250 grm. contains 1,000 calories

If we recall that the largest feeding cup holds barely 200 c.c., or 7 oz., and ten such feedings in the twenty-four hours are required to complete the schedule of 2,000 c.c. or 2 quarts daily, we realize some inherent difficulties. For example, the programme above would demand feedings at 7, 9, 11, 1, 3, 5, 7, 9, 12 and 3 a.m., none missed and every drop drained.

This diet often becomes monotonous and even nauseating, the chief complaint being against its sweetness, and substitutes may be offered in the form of milk-soups, gruel, cocoa, egg-nogs with chocolate, ice cream, custards, and fruit drinks with glucose. One hundred grammes of

the latter may be fairly successfully camouflaged by the juice of two lemons or an orange and a lemon. But, whatever the substitute, we must endeavour to maintain the average of 300 calories per feeding.

I have laid emphasis upon the difficulties in feeding, because it cannot be carried out by rule alone, and all one's resources of persistence and ingenuity, of bullying and cajolery, are taxed to keep the patient from slipping backward in nutrition. The results of ample feeding justify the effort, and convalescent typhoids now compare favourably with those of twenty years ago, when Dr. Thomas McCrae, in *Osler's System of Medicine*, wrote in 1907, "If any change from the above diet (24 to 36 oz. milk in 24 hours) be required it is usually in the direction of reduction. Patients do well on albumen water alone for some time. There is little danger in a severe attack of the patient receiving too little nourishment."

As improvement proceeds, and particularly as the patient can swallow safely, add bread and milk, soft eggs, mashed potatoes and butter, apple-sauce with cream, and other similar articles. After each feeding, as much water should be given as the patient will take, for the double purpose of furnishing extra fluid and of keeping the mouth clean.

Having said these things about calories, may we add that a calorie is nothing in itself, and because a man is condemned to weigh 70 kilos, he is not necessarily condemned to eat 3,000 calories per day, or die in the attempt, but I do say that this man's output per day is approximately so much and his intake should be approximately the same, or there will be less man there at the day's end. And again it may be said that, because a litre and a half of milk and a half a litre of cream and 250 grm. of sugar will supply this wanted number of calories, it is therefore not necessary for everyone to swallow these willy nilly, and these only. So long as the equivalents of these things are supplied in a form which the patient can take, and so long as they are structurally harmless the object is accomplished.

The matter of the cleanliness of the mouth may sound trivial, but it is the key to many typhoid problems: poor appetite, otitis media, parotitis, and bronchopneumonia. Its care in-

volves, first, ample water-intake, second, careful physical cleansing of the mouth after each bath or sponging, and the frequent use of a mouth-wash of glycerine and lemon juice, and the encouragement of nasal breathing by the use of a nasal oil spray or drops of liquid paraffin into the nostrils. If the tongue and lips dry and crack, the application of some organic silver preparation in 20 per cent solution, or irrigation with large quantities of weak permanganate of potassium solution from a douche can, through a nozzle into one corner of the mouth, while the patient lies on the opposite side, will be of service. Last, but not least, the inculcation of the habit of gum-chewing. (To be discontinued on convalescence!)

*Hydrotherapy.*—Outside of a hospital the Brand treatment of tubbing is not feasible, and even in hospitals it has largely given way to a sponging, and, candidly, I would not like to see it come back again as a routine. The blue, shivering, chattering, scared victim of this life-saving measure reminded me often of those who were cut for stone before the days of anaesthesia, and my general impression was that in the General Hospital, where tubbing and sponging were practiced at the same time, the mortality did not materially differ. When I looked up the figures I was rather startled at the result. In one service, the patients from September to March were under one attending physician and were treated by sponging and antipyretics; while from March to September they were under another and were treated by Brand baths. The following is a summary of the results from 1902 to 1913:

	Total No.	No. Died	Per- centage	Hæmor- rhage	Per- foration
Tubbed	390	13	3.4	15=3.8%	6=1.5%
Sponged	294	40	10.00	22=5.5%	13=3.3%

Which carries out to the letter Osler's statement that six to eight cases in a hundred are saved by Brand bathing. The incidence of hæmorrhage and of perforation was also materially diminished by the Brand bath. It is of interest to note that in each group of cases the deaths from perforation were one-third of the total deaths, which is the ratio given by Osler in a large group of collected cases.

The objects of hydrotherapy are:—

- (1) Vasomotor stimulation. (2) Removal of

surplus heat by conduction. (3) Improvement of skin circulation directly, and of renal circulation indirectly, through heightened blood pressure. These objects may be brought about in some persons by tepid sponging, in some by ice sponging, and in some by the Brand bath, and the fall in temperature, the general well-being, and the increase in water output offer the indications.

With sponging, it is better to begin with the simpler and proceed to the more radical measures, as occasion requires; increasing stupor or restlessness, and insufficient output being the reasons for a change. If tub-bathing is chosen as the form of hydrotherapy, it should be begun early, and not after a preliminary treatment of sponging. A sponging should last for twenty minutes, in which the four quarters of the body are successively attacked, the other three being meanwhile covered, while over the abdomen a towel wrung out of ice water is laid, an icebag is placed on the head and a hot water bottle at the feet. The sponging is followed by the toilet of the mouth and of the back, the giving of nourishment and water, and the turning of the patient on the right side after one sponging, on the left after another, and on the back after the next, to lessen the danger of hypostatic pneumonia. It has always been a source of astonishment and admiration to see how a nurse will maintain a typhoid patient's back whole and clean week after week by her assiduous washing, alcohol rubbing, and powdering, and changing of linen.

The care of the bowels may require a word. A soapsuds enema, given every other day, is usually sufficient, but if in the later period there is rectal pain, or if scybala are palpable in the lower sigmoid, a warm oil enema of six ounces may be given, to be retained for four hours and followed by a soapsuds enema, and liquid paraffin may be given by the mouth. If this is not effectual, a rectal examination should be made, and if necessary the scybala removed digitally.

What I have said covers the irreducible minima in routine treatment, but there come still certain discomforts, some of them severe, from which the patient suffers. The first of these is headache. From our standpoint, it is correct that the first week or so of the disease is characterized by headache, but we look at it like

rose spots or enlarged spleen or fever—a guide to diagnosis. It is that to us, but it is more to the patient. It is seven to ten days of atrocious pain, lasting every hour of the twenty-four; it may be as severe as toothache or earache or lumbago, and its alleviation may demand not only that we throw him an ice bag as we throw a bone to a dog to keep him from growling, but that we make occasional and intelligent use of some of the simpler analgesics to take the edge off this curse.

By us malaise also is recognized as an incident, but to the patient it has the proportions of a calamity. It is a combination of fatigue and muscular pain that is only a little worse than being beaten and left for dead. It is very real I assure you, and sponging and rubbing are a great help, but here also an occasional analgesic means not only alleviation but conservation.

Nausea, from its milder grade of simply turning up the nose at food, to actual vomiting, is a very common feature. Imagine yourself on shipboard poised for a leap to the side, and someone presenting you with a thick juicy egg-nog, sweet and warm. There is only one answer. At this time hot broths, tea, or fruit juices have a better chance of reception than sweet and viscous mixtures, and for medication some form of alkali, or a carbonated water, is often satisfactory.

Leaving now the standard discomforts, and passing to what may be called complications, we think first of diarrhoea. This is a feature which should make us all prick up our ears, for taking them by groups those patients with diarrhoea are due for much more trouble than those with constipation. It is, I think, fair to say that when diarrhoea is present the large bowel is more likely to be involved. At the beginning of looseness—more than two or three stools a day and these of a watery character—the elimination of milk and the giving of cereal gruels only, such as barley water and malted milk for two or three days, will often change the picture. If not, bismuth in large doses, half a drachm to a drachm every four hours is of service, and lead and opium only if these fail. One dislikes to use opium in these cases if it can be avoided. Once diarrhoea has occurred, the diet should be increased with great care, and acidified

milk here has its place (two drops of lactic acid to each ounce of milk).

Tympanites is an unpleasant feature, and is indicative of a fairly intense infection involving the nervous system, and demands that one should first examine the type of reaction which the spongings are producing. It may be necessary to advance to a more rigorous form of hydrotherapy, and though strychnine has gone out of fashion I think that here it has its clearest indication. Mechanical emptying of the bowel of air by enema, will prevent some of the undesirable distension, and local stimulation by counter-irritation, turpentine stapes for example, will be of use as well. The only mention of pituitrin and eserine under these circumstances is to condemn them.

Hæmorrhage is responsible for about 10 per cent of deaths in typhoid fever, and it is rather a sad commentary on our progress that it now is treated much as it was one hundred years ago, except for the venesection then employed. It is due ordinarily not to a large arterial rupture, but to oozing from ulcerated areas in Peyer's patches, and is usually an event of the third week and more frequent in those having diarrhoea. Even before the appearance of blood in the stool the falling temperature, the rising pulse-rate, and the changing colour may give us warning. Our duty now is to right about face on everything we have been doing; stop food, stop spongings, stop turning, stop visitors, stop enemas, stop talking! The nearer we can come for the time being to "statuesque immobility" the better. The one drug which will bring the bowel to this state is morphine, and an injection of one-sixth of a grain should be given. I am aware of the fact that Barker and others are opposed to morphine, on the ground that it will mask the signs of perforation, but I have the feeling that drowsiness of the patient is less a reason for this than drowsiness of the doctor. The late James Stewart, among many wise sayings, used to say "The first aim of treatment is to prevent death," which sounds trite but is very true, and hæmorrhage is an emergency holding death in its hand.

It is common practice to raise the foot of the bed when hæmorrhage occurs. This does not seem rational, for by this means a greater flow of blood to the brain occurs, with consequent rise in blood pressure, which tends to increase the bleeding. If however the blood loss is so great

that syncope occurs, this measure is justifiable, like burning the ship's fittings to keep the engines running. For the same reason transfusion or intravenous saline are not always indicated, but with approaching syncope the former especially is urgently demanded.

Small doses of blood given for their effect upon coagulation come into another category, and in an emergency, if grouping has not been done, 10 c.c. of whole blood may be given into the muscles of the back or buttock. Of the various proprietary coagulants I am not prepared to speak. Hanzyk and Weidenthal, from a carefully worked out series of observations, do not think much of them. The manufacturers themselves are favourably disposed toward them. Again to quote James Stewart, "It is likely that they will do no hurt." Of calcium lactate the same may be said. Intravenous administration of 5 c.c. of 10 per cent saline has its advocates, and there seems reason in the procedure, but I have seen several instances of local necrosis of skin and subcutaneous tissue follow its use.

And now I would like to hedge on some things already said. The "statuesque immobility" pose may be overdone, and I recall at least two instances in which after a period of immobilization for hæmorrhage, typhoid patients have, as a consequence, died of septicæmia resulting from rapidly developing bed sores. For this reason, before twelve hours have elapsed, a pillow should be cautiously pushed under one side to relieve pressure on the sacrum and this region carefully cleansed and washed with alcohol. In a few hours the same plan should be followed on the opposite side. Sips of water may be given after six or eight hours, and small amounts of liquid nourishment at the end of twenty-four hours. Catheterization is preferable to allowing people with recent hæmorrhage to strain at micturition.

The treatment of perforation is scarcely within the medical province, but since its recognition is part of medical treatment in general, one cannot pass it by. It is as simple as 1, 2, 3—on paper, but the infallible proofs are few. Has something unusual occurred? People with typhoid have no business to have unusual things occur to them. And when they do occur the chances are that they are serious.

If the patient's look, or his pulse-rate, suggests something unusual, or even if they don't,

if examination of the abdomen shows limited respiratory movement in the lower half or quarter, and if there be ever so little difference in the resistance of the two sides, perforation is probable, and the treatment obvious. Better open three abdomens needlessly, though even this is not desirable, than leave one unopened that should be opened. But, let us never forget the full bladder. A rise in the leucocyte count may occur, or it may not, and its absence should never put us off the track, if physical signs of perforation are present.

Cholecystitis should be treated expectantly as long as, or longer than, one would temporize with it when typhoid is not present. This man is not a good subject for an upper abdominal operation.

Such complications as pneumonia, otitis media, phlebitis, furunculosis, must be treated on their own merits.

Delirium is a manifestation of toxæmia, and should be so treated, except that a cold pack is often well substituted for a sponging, and in the patient with a dry tongue who mutters, and picks at his clothes, or stares wide-eyed at the ceiling, alcohol has its place.

In acute mania, **which fortunately** occurs but rarely, restraint may be necessary and hyoscine may be required, but it may do its work too well. Sometimes, in delirious states, an intravenous glucose-saline is most useful if someone else can be got to give it. And lumbar puncture is useful here, as it is in the delirium of pneumonia.

What of so-called cardiac failure? I may be wrong but I am of the opinion that it very seldom occurs. Personally, I have never seen it. Heart-failure has a very definite picture; dyspnoea, cyanosis, oedema, etc. The gradual petering out of a typhoid patient is not like that. Weakness, rapid pulse, falling blood-pressure, blueness of the extremities, mean rather a general poisoning in which the central nervous system is hardest hit, and its treatment is that of elimination and conservation rather than cardiac stimulation. The good accruing from cafffein, camphor and strychnine comes from the stir which they give to the bulbar and spinal mechanisms. Intravenous injection of glucose-saline here seems the most rational procedure.

And when the fever has left him—what of convalescence? A most convincing article by Dr. Thayer appeared in 1919, entitled "Medical aspects of reconstruction," which was a report upon the work of convalescent camps in the American Army in France. Observations were made upon the length of time required to render men fit for full duty after illness from various diseases, and I quote one paragraph: "When we consider that it takes a robust young soldier thirty-four days to pass through and recover from the effects of an acute tonsillitis, fifty-eight days from a pneumonia, seven weeks from a herniotomy, and five weeks from a tonsillectomy, with all the advantages of a convalescent hospital, we may well pause and reflect. The grave sequels of so many acute infections, especially the psycho-neurotic phenomena following operations and many of the continued fevers, might well be in part avoided if we possessed in civil life opportunities to offer adequate care of convalescence."

One cannot imagine a man systematically poisoned for weeks, poisoned in cortex and medulla, in adrenal and pancreas, in heart and liver, and kidney, who can a week after his fever has left him skip like a young lamb and carry dishes like a beast of burden. It is not only weeks, it is months which he requires, even to put him back to where he was before he took ill, let alone to fit him to carry the increased load which illness has thrown upon him.

Before the patient passes out of our hands we have a duty to the community. It may be loosely said that water and milk are the causes of the spread of typhoid. This is only partly true. The infection gets *into* the water and the milk because it *got out* of someone who had typhoid fever, and whose excreta were not rendered harmless. This matter is all in the hands of the attendants upon the sick man, and the sterilization of the urine and stools and of all contact materials and of the hands of the attendants will prevent *any* milk or *any* water *anywhere* from carrying the disease.

Bacteriological examination of stools and urine should be a routine, before any patient can be permitted again to go upon his lawful occasions without risk to the community.

**An Address  
ON ACNE VULGARIS\***

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THE pimply-faced youth or maiden is a sight with which we are all familiar. The status of pimples as a youthful attribute is recognized commonly by the laity as well. It is probably due to this acquiescent acceptance of things as they are that the busy doctor does not take the ordinary case of juvenile acne very seriously. He may feel rather helpless if such a case demands relief, and think that there is little to be added to the classical medical injunction, "Fear the Lord and keep your bowels open." He usually expands this with the addition of a few platitudes as to the necessity of plenty of fresh air and exercise, leaving sweets alone, and the consolation that the patient will grow out of it in a few years anyway.

So far, so good. But youth must be served, and for diverse reasons, most of them good, youth demands better service than this. The high school and college students who find themselves socially handicapped, the young people in business and commercial life who must face a fussy public, and who find their jobs jeopardized by the unwholesome appearance of their countenances, insist that they cannot wait upon the *vis medicatrix temporis*, but must have their blemishes taken away forthwith.

Therefore, it is in the hope of contributing something of practical interest to this evening's programme that I have chosen Acne Vulgaris as the subject for this paper. Thus I am going to be bold in touching but lightly upon details of such matters as classifications, minute pathology, and so forth, and in connection with treatment will confine myself to my own experience, rather than attempt to present a résumé of all the various methods of treatment and the drugs with which I have only a second-hand acquaintance.

Beside the acne of our common experience, acne vulgaris, or the juvenile acne of Brocq's classification, there are some other conditions bearing the name "acne," such as acne rosacea, acne necrotica or varioliformis, acne keloid and tar acne. These diseases introduce questions of

etiology, pathology, and therapy foreign to the subject of this paper. Even acne rosacea, which has many superficial resemblances to ordinary acne, is considered by some authorities as a distinct disease, which should be called simply rosacea, while the others are hardly justified in their name by a superficial resemblance to the subject of any paper.

In works on dermatology there is a tendency to classify acne into groups characterized by their predominant symptomatology, such as, seborrhoea, comedones, papules, pustules, induration, cicatrization, etc. Rarely if ever does one type of lesion persist purely throughout the disease, and most commonly several, or all of these features, are seen in combination or in succession, with one or other predominating from time to time. There is one type to be included in this paper, however, which is closely related to the disease as seen in adolescence, but which has a special age-incidence, special etiological features, and requires special therapeutic consideration. This is the acne of the third and fourth decades, often directly continuous with or a recurrence of the juvenile disease, but sometimes seen in subjects who never had acne when younger.

With the exception of the last-mentioned class, acne vulgaris is a disease of adolescence. Its frequency is equal in the sexes. The immediate cause is bacterial infection, but the disease illustrates excellently the very important role of the soil in which the seed is sown.

The advance of puberty is characterized by certain changes throughout the body, and the development of what are known as secondary sexual characteristics. Upon the skin the most noticeable change is the development of terminal hairs in regions where hitherto only downy hairs were known. Closely associated anatomically with the hair-follicles are the sebaceous glands, and these share in the increased activity of the former. Thus one of the earliest and commonest manifestations in the skin of the young adolescent is an increased oiliness or seborrhoea. The regions especially affected are the scalp; the face, particularly that oval area sometimes called the 'flush area,' bounded between two curved lines

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which meet at the hair-line on the forehead and the tip of the chin; the upper anterior thoracic, interscapular, and deltoid regions. The glands, filled with cellular debris and sebaceous secretion, furnish ideal tubes of culture-medium, and frequently become inoculated with bacteria. Among these, a very small bacillus, known as the microbacillus of Unna or the *B. acnei*, was at one time considered to be the specific germ of acne. These are always found in quantity when a comedo or some of the fatty filaments from the glands at the side of the nose are pressed out when methylene blue stain will show them at the proximal end. The role of this bacillus is not yet determined, but the idea of its specificity is not generally accepted. In addition, staphylococci of several types are always present. The result of bacterial activity appears as more or less irritation of the pilo-sebaceous epithelium, with the formation of a mass of horny cells mixed with sebum and detritus, which becomes partially extruded from the mouth of the follicle. The projecting portion becomes darkened by oxidation and the whole structure forms the familiar 'blackhead' or comedo. More extensive irritation of the immediately surrounding tissues may produce inflammatory dusky red papules. Sometimes, and especially as a result of forcible attempts at expression, these attain considerable size. The activity of the pyogenic organisms may produce a small pustule about the comedo, or may convert the inflammatory papule into a tender, indurated mass, from the size of a pea to that of a hazel-nut, containing pus and having many of the clinical appearances of a furuncle.

Thus we may have in succession, or synchronously, seborrhœa, comedones, papules, papulopustules, and pustules. Any one may dominate the picture, but rarely so to the exclusion of the others. The seborrhœal flux and the comedones are the most constant features. In the interscapular region comedones may reach prodigious sizes, such as a length of five to seven millimetres and more than a millimetre in diameter. Here are sometimes seen double comedones, two discoloured ends projecting from separate openings, which when removed leave a small tunnel in the epidermis, and later, band-like scars.

The diagnosis seldom offers much difficulty. the seborrhœa and the comedones are the most characteristic lesions, the age of incidence has fairly sharp boundaries, and the areas affected are well defined. In young adults the possibility of a papular or pustular syphilide is not to be

overlooked, and can usually be eliminated with ease. In a recent case, however, I saw a young man with extensive and severe acne, who at the same time had a papular syphilide, in which the specific papules were scattered among the acne lesions on the face and upper trunk. Occasionally, an eruption produced by iodides or bromides may be encountered, closely simulating papular or pustular acne, but the suddenness of onset should provoke inquiry as to what medicines, especially proprietary or patent "blood tonics," the patient has been taking. Variola has been taken for acne, as in the case of a young woman who was once referred to me by her family physician for the treatment of pimples on her chin. The pimples were smallpox vesicles, but they had considerable resemblance to acne pustules. I have also seen two cases of acne in which facial herpes zoster developed, leading the attendant physician to refer the patients to a dermatologist, on account of the unusual behaviour of the lesions in coalescing and forming crusts. Acne varioliformis is distinguished by the tendency of the indurated, indolent, papules to undergo central necrosis. Tar-acne and oil-acne have no special age-incidence, their most common sites are the parts of the body covered by clothing, and saturated with dust and oil, and are directly due to occupation, being in reality industrial dermatoses.

About the beginning of the third decade the affection usually comes to an end. If pustulation, and the formation of deep-seated inflammatory nodules, have been prominent features of the disease and this has continued unchecked, the patient may bear scars which produce disfigurement. Red, and producing an irregular surface at first, they will fade and flatten out with time but some permanent traces usually remain. If hygiene has been faulty, with resultant anaemia, debility, and digestive disturbances, including constipation, or if foci of chronic infection exist, the acne may be prolonged far into adult life. This brings us back to a consideration of the type of late acne mentioned before.

The patient with this condition usually seeks medical assistance well on in the third or even in the fourth decade. The patient is most frequently a woman, usually unmarried. We may learn that she had a mild degree of acne as a young girl, which has never left her, and lately has become worse. It may have recurred after some years of freedom; or she may never have

noticed pimples until she was over twenty-five. She is frequently a brunette, her scalp shows a good growth of hair, and is very oily. Her skin is often coarse in texture, showing "large pores" as she terms it; it is "muddy" or "dingy" in colour, and in the furrows at the side of the nose there is a greasy scaliness. The chin is pimply. There are dusky or livid red lumps upon it, and usually two or three (seldom more) fully developed yellow-topped pustules. There is a tendency, sometimes very pronounced, to hypertrichosis of the upper lip and chin; much heavy fuzz, and a varying quantity of terminal hairs. There may be lesions on other parts of the face as well, but the chin is so uniformly involved that with the French the type goes by the name of *acné mentonnière*.

There is usually a history of more or less dysmenorrhea, of flushing, and the appearance of a few pustules as the usual precursor of the periods. Constipation is the rule. Naturally, cases will be encountered, varying in some details from this picture. Yet, there are doubtless some here who remember hearing the lecture Sir Arbuthnot Lane used to deliver from time to time, about fifteen years ago, in which he graphically sketched his pet picture of the young woman with the redundant colon. He told of her relaxed abdominal wall, the lumps in her breasts, her complexion, her sexual and psychological difficulties, and he told us how Rudyard Kipling has personified her in his "Light That Failed," in the character of Maisie. I do not know how far Sir Arbuthnot has since proved to be right in regard to the role of the kinked colon, but the picture he drew was the same as that which I have tried to put before you:—the young woman with the pimply chin and the home-keeping disposition. Nowadays, it is customary to look beyond the colon, and talk of endocrine dysfunction.

In dealing with a case of acne, internal derangements must be given prior consideration, and we must at least make a start on the road leading to their correction before even thinking about local remedies. In fact, some cases will look after themselves without any special attention to the skin, once the interior economy is set in order.

It is advisable to commence with an investigation of the patient's habits and mode of life, with special reference to the nature of the occupation, the amount of time spent in the open air, the amount and nature of recreation, the nature

of the diet, the presence or absence of constipation, and in its presence, the means taken by the patient in attempting to remedy it. Obvious errors should be pointed out to the patient, and advice given for their correction. The information gained should give certain leads to be followed in the physical examination. This should include an examination of the urine, which should be tested for indican as well as in the routine way. A haemoglobin estimation and erythrocyte count should also be made. In connection with the skin the degree of oiliness of the scalp is to be noted, and the way in which the hair is dressed. The fashion amongst boys of allowing the hair to grow long, and plastering it down with brilliantine or some other oily preparation, should be interdicted, and the patient told to get a military trim. The girls who assure you, with conscious virtue, that they seldom or never use soap or soap and water on their faces, but use instead "cleansing" or "vanishing" creams, must be firmly told that there is no substitute for soap and warm water, and creams are not to be used for such purposes.

Errors in personal habits and any physical derangements disclosed having been taken in hand, the next subject which engages the attention is the diet. It is assumed that gross and obvious errors which have already become apparent, such as excessive use of carbohydrates and fats, indulgence in tobacco and alcohol, and hasty eating have been dealt with. After this is done, it remains to impose certain restrictions and prohibitions, giving the patient to understand that classes of foods not thus referred to may be taken. If time and the extent of my knowledge permitted, I should like to give chapter and verse, justifying rationally each of these taboos. But, with the laboratory demonstrating to us that fried potatoes are quite as digestible as any other, and that the general run of acne patients do not show any lowered carbohydrate tolerance in comparison with other groups, it might as well be admitted that much of the dietary regime has no more than an empirical basis. However, when a young patient who has been progressing nicely for some time comes in with a fresh and florid outbreak of papules and pustules, and admits that this has followed directly upon a gastronomic spree, in which pastry and ice-cream figured largely, we feel that the laboratory may not have said the last word.

Rather than give the patient a list of articles

which he may not take, it is better to enlist his intelligent co-operation by classifying these foods and giving him a few illustrations of each group. The usual direction are then about as follows:

*Beverages*.—No iced drinks or ice-cream; no chocolate in any form, including cocoa; tea and coffee, not to exceed one cup at a meal, and this not to be strong or very hot.

*Fats*.—Cooked fats to be avoided as strictly as possible. This includes all fried foods—meat, fish, vegetables, or cakes—all pastry, “cream” soups, thick gravies, white sauces on fish or vegetables, “made” dishes, pork, goose and duck. Raw fats, such as butter, oil and cream are permitted in moderation. Toast should be thin, so that the entire thickness is dry; a thick slab of bread toasted superficially by rapid heat and soaked with melted butter, as so frequently served, is the equivalent of so much fried dough.

*Condiments*.—All, except salt, including foods prepared with spices, such as curries, sausage, etc., relishes, sauces, and pickles, are forbidden.

*Carbohydrates*.—Having regard to the special requirements of adolescents and young adults, the patient is asked to curtail his intake, particularly of sugar and sweet foods. Candy is not absolutely forbidden, but it must be of the simplest kind—sugar, water, colour and flavour—and in very small quantity. Neither are potatoes forbidden, but the patient is told to choose green vegetables by preference, whenever the choice is possible.

*Preserved Foods*.—All meat and fish, preserved by salting, pickling, drying and smoking, meat and fish pastes, and cheese, with the exception of fresh cottage cheese, are forbidden.

The patient is finally warned against taking food or drink at extreme temperatures, and counselled to avoid alcohol and tobacco.

The hygiene of the skin comes next. Commencing with the scalp, the patient is told to shampoo at least once a week. Sabouraud's method is particularly applicable and agreeable in the case of women, and places the proper emphasis on the fact that it is the scalp, and not the hair, which requires cleansing with soap and water. It consists essentially in the use of home-made castile soap jelly, (let a cake of soap stand in half an inch of water for a few hours), and its application to the scalp with a medium soft tooth-brush, with which the lather is worked in. After thorough rinsing, the head is dried with warm air or soft warm towels, avoiding vigorous friction. Nothing else is to be used on the scalp,

unless ordered by the physician. If seborrhœa is excessive at the outset, or if improvement is not noted in about a month, a local application, to be mentioned later, may be considered.

The face and other parts affected are to be shampooed twice daily, using castile soap, warm water, and a face cloth. Steaming is not advised. Immediately before this, as many comedones as possible are to be expressed with one of the small instruments designed for the purpose and to be had at any drug store. These do less harm than the time-honoured watch-key or the finger nails. Superficial pustules are to be opened by transfixing with a large straight Hagedorn needle, and the small firm bead of pus pressed out by lateral pressure with the needle. No squeezing is permitted. Large indurated pustules and nodules are to be opened by the physician, and papules are to be left severely alone.

Hot baths are forbidden. This point must not be overlooked, for most young women, and not a few young men, are given to the habit of long luxurious steaming soaks whenever opportunity affords, and the effect of these on acne is unfavourable. The patient may bathe as often as he pleases, but the use of a shower or bath-spray is advised to ensure that the bath will not be too long, or too hot and relaxing. For the sake of emphasis, reference might be made again to the importance of keeping the scalp in a healthy condition by means of frequent shampooing. So long as ammonia, borax, and other alkalies are avoided, excessive drying of the scalp need not be feared, while the attempt to treat acne of the face in the presence of the oily scalp, laden with dust and scales, often formed into a retentive dressing by the use of some grease or other, is futile. Don't accept too readily the patient's statement that the hair or scalp is too dry. In normal health an excessively dry scalp is a rarity, while the excessively oily scalp is common. When a patient says his or her scalp is too dry, examine it four or five days after a shampoo and rub the scalp lightly with a cigarette-paper. Take another leaf, fold it and draw a few hairs through the fold. Show the patient the grease spots.

Thus far nothing has been said about topical applications. In the mild case at least they are of distinctly secondary importance, in comparison with the measures already advised. In such cases, where seborrhœa and a few comedos predominate, especially in incipient cases, or in those nearing the natural termination of the

disease, a simple lotion of one per cent salicylic acid in alcohol with a little boric acid and glycerine and a drop or two of oil of roses makes a pleasant mild astringent. It may be used with benefit as an "after-shave" or toilet lotion once or twice daily for an indefinite period, in those whose skin is inclined to be oily. Nothing more is required in some cases, and in many more it is a good preparation to use after the disease has come well under control, and the need for more active remedies has passed. A more powerful astringent, that is useful in acne and other conditions where seborrhœa is persistent and very considerable, is the old French preparation known as eau d'Alibour. The following formula is that given by Darier, slightly modified for use in this country. It may be used on the scalp as well.

Cupri sulphat.	1.0
Zinc. sulphat.	3.6
Pulv. camphor.	0.4
Pulv. saffron.	0.2
Aquae q.s ad	120.0

A small quantity diluted with five volumes of water should be sponged on once or twice daily.

In the ordinary oily scalp with dandruff, if anything besides the shampoo is needed, the following formula of Sabouraud's is useful and will show good results in most cases after steady use for two or three months:

Ol. cadini	10.0
Ol. cedri ligni	10.0
Aceton.	30.0
Alcohol. q.s. ad	125.0

The scalp should be moistened with this the night before shampooing, rubbing it in with a cotton pledge. In both this and the first-mentioned formula rubbing-alcohol is quite as satisfactory as the more expensive grain-alcohol, provided it does not contain any methyl alcohol. There are several brands to be had, denatured with di-ethylphthalate and brucine, which fill the requirements.

In the more severe cases sulphur is the remedy of choice, holding first place with all authorities. For the face, lotions having a definitely astringent action upon the oil glands, and producing a moderate amount of desquamation of the heaped-up, keratinized, and oil-soaked epithelium, are necessary. These are to be sponged on morning and evening after the shampooing, and left to dry. More or less powdery deposit will be left upon the face, which after a few days is augmented by fine dry scales. It is thus as well, when ordering one of these lotions, to warn the patient

that, due to the floury appearance and redness, the face will not appear to show much improvement for the first two or three weeks. At the same time the patient may be instructed to use the lotion less liberally in the morning, to dust off the excess before setting out to business, and, in the case of a young woman, if it is felt that something can be trusted to her discretion, she may be permitted, in the good cause of maintaining her self-respect, to try what can be done in the way of amelioration by the cautious use of her customary cosmetics.

The patient must be further warned that after a day or two the skin will feel dry, stiff and tight, and that to maintain this condition in a moderate degree is desirable. If through excessive zeal the face is made really sore, the use of the lotions may be suspended for a day or two, and in exceptional cases the use of a little cold cream permitted. The patient's own experience is the best guide as to the frequency and quantity of lotion applied, but it must be seen to that its use does not become merely perfunctory, and slack off to a mere ineffectual dab occasionally.

Two representative formulae are, Duhring's lotio alba:

Zinc. sulphat.	4.0
Pot. sulphurat.	4.0
Glycerini	6.0
Aq. Rosae q.s. ad	120.0

which is satisfactory in a large proportion of cases, and Kumafeld's lotion:

Sulph. præcip.	16.0
Pulv. camphoræ	0.65
Pulv. tragacanthi	1.3
Aq. calcis	60.0
Aq. rosae	60.0

The latter is more powerful in its action, but may be used as a prescription, to alternate with the lotio alba, using a bottle of each in turn.

For the disease on the trunk, a dry powder, as recommended by Ormsby, is dusted on morning and night, following the shampoo of the affected parts. Its formula is:

Sulph. præcip.	30.0
Ac. Boric.	30.0
Talc. pulv. q.s. ad	120.0

Two physical agents are in wide use to-day in the treatment of acne. They are ultra-violet rays, usually generated by quartz mercury-vapor arc lamps and Roentgen rays. The former have a weak drying and astringent effect, if used to the point of producing erythema and desquamation,

but it is doubtful if this is superior to or more agreeable than local applications. The value of generalized ultra-violet radiation of the body surface in conditions of malnutrition, anaemia, and debility is unquestioned, and where these exist with acne, ultra-violet rays may be a very useful adjunct in the treatment. Where there is extensive pustulation on the trunk, ultra-violet rays are useful, since treatment of a large area is called for, and Roentgen rays are undesirable.

The careful and discriminating use of the Roentgen rays is undoubtedly one of the most useful remedies we have. It is not called for in all cases, and in some is contraindicated. Used by one who is at once familiar with the disease and experienced in the use of the modality, working with a machine which is carefully calibrated and permits accurate measurement of dosage, in selected cases it usually gives excellent results. Using unfiltered radiation, with the eyebrows, hair and the front of the neck screened off with lead, one-eighth of a skin-unit (McKee) is given to the central parts of the face, and one-fourth to each lateral aspect, once weekly. Eight to twelve such treatments are ordinarily given. More are rarely necessary, and if so, an interval of six to twelve weeks is advisable before continuing. Any tendency to flushing of the treated areas, which should be tested for before each treatment, and which gives warning of impending erythema, should be taken seriously. X-ray erythema, as distinguished from the static erythema occasionally seen, is to be avoided at all costs. In hypertrichosis the presence of many freckles or small brown pigmented moles, or pustulation, Roentgen rays are contraindicated. Pustules and intradermal abscesses often yield to six or eight weeks' treatment with quinin, taken internally in doses increased as far as possible without producing signs of cinchonism, following which Roentgen rays may be used if necessary.

In most cases, improvement will be apparent

within a month, and provided the patient's co-operation has been satisfactory and the health is otherwise good, the patient will be sufficiently improved in three months to be released from regular attendance. It is well after this to require a visit about once a month, when any erring tendencies or relaxation may be checked. The regime ordered must continue without intermission or slackening for at least a year after active lesions have ceased to appear regularly, and the salicylic-alcohol kept up.

Occasionally, men well on in the third or fourth decade will be found with numerous scars on face and trunk as well as abundant active lesions. In the absence of obvious symptoms of ill health, or evidence of dissipation, focal infection, especially in the teeth, tonsils, or accessory sinuses, in the order mentioned, is frequently found.

The same may be said of women, but as mentioned in an earlier paragraph, we get more often a history in these cases strongly suggestive of endocrine derangements, and they sometimes need some pelvic trouble put right. These patients seldom show a basal metabolic rate below normal limits, but they nevertheless seem to be favourably influenced by the administration of thyroid gland in dosage just large enough to show physiological effects. Focal infection seems to be commoner among women than in men, and just as we all have seen from time to time remarkable results in other conditions follow the eradication of diseased teeth or tonsils, so has it been in acne. It is in some cases of this type that vaccines have been found useful. I have not had any occasion to use vaccines when treating acne in private practice, and my small experience with them in dispensary work is that of others whose experience has been more extensive. In a few cases results are ideal, in some others the effects are unfavourable, and in the great majority no effect is observed.

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**Pulmonary Tuberculosis**—Some of the facts brought out by the group of cases reported by S. W. Schaefer, Colorado Springs, are: Tuberculous lesions in the lungs do heal by absorption of infiltrations as well as by scar tissue formation. Tuberculous cavities in the lung do become very much smaller with improvement, and in some cases they apparently entirely disappear as far as the physical observations and the roentgen-ray examination can show. Artificial

pneumothorax is often of great aid even in cases of pronounced bilateral tuberculous disease. If the body is relieved of the tremendous poisoning from a massive lesion in one lung, it may be able to cope successfully with a smaller lesion in the other. Most tuberculous patients are apparently helped by a high, dry, sunny climate such as that in Colorado, and in some cases such a climate may be the deciding factor in the recovery of the patient.—*J. Am. M. Ass.*, 1927.

## An Address

ON

THE EXOGENOUS AND ENDOGENOUS CHEMICAL  
STIMULI AFFECTING THE MOTILITY  
OF THE ALIMENTARY CANAL\*

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FOR a long time now, certain facts have been known about the influence of chemical substances normally present in the chyme on the motor activity of the alimentary canal. However, the systematic study of these effects and their experimental analysis have only recently been begun. This statement does not apply to the action of drugs. The study of their influence on the movements of the alimentary tract forms an important, though far from complete, chapter of pharmacology.

When we speak of the secretory reaction of the alimentary canal to different stimuli produced by substances coming into contact with its walls, we naturally always have in mind the possibility that they may act upon the secretory elements mechanically, as well as chemically, whether directly or indirectly. The same holds good for the motor processes of the digestive tube. The food-masses, mixed with the different digestive juices, not only mechanically affect the wall of the gastro-intestinal canal, but may act on it by the chemical substances which they contain. All these substances may be called: *natural chemical stimuli of the movements of the alimentary canal*.<sup>1</sup>

In the following table are enumerated the natural chemical stimuli: (See page 268).

One can see from this table that all parts of the alimentary tube containing in its walls smooth muscle, are subjected to the positive or negative action of very different chemical agencies. These chemical substances are present in the food, or arise from the food masses as the products of their enzymatic decomposition, or belong to the digestive juices themselves. Let

us discuss certain points of action of natural chemical stimuli, which will emphasize their importance for the motility of the alimentary tract and their participation in the normal processes of digestion.

THE TWO-FOLD ACTION OF SOME OF THE  
NATURAL CHEMICAL STIMULI

As an example may be quoted the action of hydrochloric acid on the movements of the small intestine. A loop of duodenum or small intestine, deprived of its extrinsic innervation, of a decerebrated animal (cat) is used. The movements of the loop are registered by means of the filling method. Into the loop is introduced 0.15 per cent HCl or 0.9 per cent NaCl, as a control, in the same amount.

The following cases of the action of hydrochloric acid may be observed (Babkin<sup>2</sup>):—

1. With normal saline, very weak contractions or none at all. This indicates that the mechanical stimulation by an indifferent solution is almost ineffective. A solution of hydrochloric acid evokes strong contractions of the isolated loop, after a certain latent period.

2. Contractions are seen with normal saline (occasionally small portions of food in the gut). Hydrochloric acid increases these contractions, chiefly by increasing the diastole of the intestine.

3. Powerful contractions with normal saline (usually in a fed animal). Introduction of hydrochloric acid provokes a strong initial contraction of the gut, sometimes a peristaltic wave, and then the contractions are diminished or stop altogether. There is also a marked fall in the tone of the intestinal loop.

Thus the state of excitability of the neuromuscular apparatus of the intestine plays a very

\* Read before the Medical Society of Nova Scotia, Halifax, N.S., Jan. 19, 1927.

important part in the reaction of the intestine to the chemical agent. In an inactive intestine acid excites strong contractions. Very active preparations are inhibited by the same solution. This fact is not an isolated one. In the stomach of the frog, *e.g.*, the pyloric part is the

DIFFERENT CHEMICAL STIMULI PROVOKE VARIOUS REACTIONS IN DIFFERENT PARTS OF THE ALIMENTARY CANAL

Weak solutions of hydrochloric acid stimulate the contractions of the cardiae part of the stomach, whereas those of the pyloric part are

TABLE I  
NATURAL CHEMICAL STIMULI

CARDIAC SPHINCTER		CARDIAC PART OF THE STOMACH	
<i>From the oesophagus</i>		-	Weak solutions of acid
Neutral or alkaline fluids	+	+	Strong solutions of acid
Carbonated water			(Periodical contractions are inhibited by acid, fat, alcoholic beverages, carbon dioxide. The movements of the stomach are inhibited by fat.)
Irritant liquids	+		
<i>From the stomach</i>			
Acid	+		
PYLORIC PART OF THE STOMACH		PREPYLORIC SPHINCTER	
Acid	-	+	Fat from duodenum
Alkali	+		Acid from duodenum
PYLORIC SPHINCTER			
Acid (from the stomach)	-		
Acid, fat (from the duodenum)	+		
SMALL INTESTINE		LARGE INTESTINE	
Acid HCl.	+	+	Acid
Organic (acetic, butyric, tartaric, citric, lactic) acids	+		Alkali
Alkalies	+		Soap
CO <sub>2</sub>	+		Lactic acid
CH <sub>4</sub>	+		Propionic acid
H <sub>2</sub> S	+		Butyric acid
Fat	+		Capronic acid
Soap	+		Bile
Fatty acids	+		
Glycerine	+		
Skatol	+		
Phenol	+		
Glucose	+		
Lactose	+		
Peptone	+		
Liebig's meat extract	+		
Amino-acids	+		

Remarks: + means activation of motility; - means its inhibition.\*

most sensitive to hydrochloric acid, being especially inhibited by its weak solution. Such solutions usually increase the movements of the cardiae part, which is inhibited by hydrochloric acid in higher concentrations. But, in cases of decreased irritability of the region of the cardiac pulsating ring, the inhibitory action of hydrochloric acid is first noticed in this part (Babkin<sup>3</sup>).

The previous state of rest or activity of the prepyloric sphincter is also reflected in its reaction to a given stimulus (HCl or water) (Rojanski<sup>4</sup>).

\* The literature concerning the data of this table one may find in Babkin's: *Die Aussere Sekretion der Verdauungsdrüsen*, 2nd. ed. (in press). There may be found also the discussion of the problem of "acid control" of the pylorus.

inhibited, (Ducceschi,<sup>5</sup> Edelman,<sup>6</sup> Babkin<sup>3</sup>). Alkalies greatly increase the activity of the pyloric part of the stomach; the cardiae portion is less affected or even inhibited by stronger doses (Babkin,<sup>3</sup> Goldenberg<sup>7</sup>). The inhibitory action of hydrochloric acid in appropriate concentrations is more marked in the small than in the large intestine (Lurje<sup>8</sup>).

SPECIFIC ACTION OF NATURAL CHEMICAL STIMULI

As is well known, there are several forms of movements of the gastro-intestinal tract: rhythmic segmentation, true peristalsis of the small and large intestine, peristalsis of the stomach and anti-peristalsis of the proximal part of the colon, spastic contractions of the intestine, etc. But the causes which de-

termine one or another form of the movements are not clear. Thus, food-masses in a certain part of duodenum may be subjected to rhythmic segmentation, say for thirty minutes. From time to time, the separated pieces of the chyme are caught by a peristaltic wave, moved forward a certain distance, and gathered into a new mass. Here again, the food-masses are segmented during a certain period of time, until a new peristaltic wave moves them to a new location, and so on. The replacing of one form of movement by another is not easily explained by the changes occurring in the physical properties of the food masses. One is more inclined to think, in this case, of changes in the chemical composition of the chyme subjected to the action of various juices and their enzymes.

Certain properties of the natural chemical stimuli may throw light on this problem. To begin with, we may discuss their specific action. By this we understand a typical motor reaction of the alimentary canal, provoked by some of the chemical agencies. Thus, hydrochloric acid, introduced into the small intestine, usually increases the rhythmic segmentation. The peristaltic waves may arise occasionally under its influence, but this form of movement is not typical for the acid. On the other hand, soap solutions provoke chiefly peristaltic movement of the intestine (Babkin,<sup>2</sup> Woskresenski<sup>9</sup>). Solutions of sodium carbonate and bicarbonate, equivalent in alkalinity to the soap solutions, give rise to strong rhythmic segmentation, and sometimes to spastic contractions of the intestinal loop, but not to peristaltic waves (Woskresenski<sup>9</sup>).

The same is true for the movements of the stomach. Thus, the movements of an isolated frog stomach are increased under the influence of a weak solution of acid and alkali introduced into it, and yet the character of the contractions observed is not the same in both cases. Under the influence of acid the tone declines a little; the activity of the pyloric region is somewhat depressed; an increase of contractions is observable in the cardiac portion; the waves of contraction are still able to move along the stomach, but their speed is diminished. Under the action of an alkali the tone of the organ is raised; then there is a marked increase in the activity of the pyloric part, the contractions becoming more extensive and violent (Babkin<sup>3</sup>).

These examples plainly show us that the natural chemical stimuli may act not only differently on different parts of the alimentary canal, but they are able to provoke various kinds of movement of one and the same part of the gastro-intestinal tract, *i.e.*, they act specifically.

#### LOCAL AND DISTANT ACTION OF THE NATURAL CHEMICAL STIMULI

The influence of the natural chemical stimuli on the movements of the alimentary canal is not restricted to the place on which they are acting. Their effect may be noticed in the remote parts of the digestive tract.

These are the experimental data (Woskresenski<sup>9</sup>). In a decerebrated cat two intestinal loops are denervated, isolated, and connected with a registering apparatus. One of the intestinal loops is filled with saline; into the other is introduced a solution of a natural chemical stimulus. Usually, the control loop repeats the movements of the loop filled with the tested solution. But the inhibitory action of acid, as well as the stimulating action of sodium carbonate or soap, is always less effective, and appears later in the control loop than in the loop filled with the solution being tested. There is no difference which part of the small intestine—the duodenum, or the lower part of the jejunum or even the ileum—is used as a control loop, and which serves for testing the chemical agent. The changes in the movements always appear in one of them if the other is filled with a solution containing a natural chemical stimulus. It must be added that, if this last solution is too weak, it has to be renewed. Only then does it produce its typical effect.

There is a little doubt that in this and analogous cases the chemical agent is acting through the blood, because both of the intestinal loops are deprived of their extrinsic innervation. There is also direct evidence that it is really so. Liebig's meat-extract, injected into the blood, stimulates the movements of the small intestine; contrariwise, the local application of this extract to the mucous membrane of the intestine inhibits the intestinal movements. The analysis of these facts shows (Sinelnikoff<sup>10</sup>), that the inhibitory action of the local application of Liebig's extract is due to its acid reaction. Being neutralised, it stimulates the movements

in the same manner as after injection into the blood.

Furthermore, when two intestinal loops are used, one (control) filled with 0.8 per cent sodium chloride, the other filled with unneutralized 5 per cent Liebig's extract, the events are as follows. The spontaneous movements stop in the intestinal loop which is under the direct influence of the Liebig's extract, but the contractions increase in the control loop, just as when the extract had been injected into the blood (Woskrensenski<sup>9</sup>).

These experiments show that the action of natural chemical stimuli is not limited to the part of the intestine on which they are acting. They may produce, after being re-absorbed, certain changes in the composition of the blood which may influence the remote parts of the alimentary canal. Experiments of Mr. Morton, performed in this laboratory, showed that the introduction of 20 c.c. of 0.4 per cent hydrochloric acid into the duodenum of an anæsthetized cat (pancreatic juice and bile were directed from the intestine) raises the hydrogen ion concentration of the blood from pH 7.4 to pH 7.2, and lowers its alkali reserve. One per cent sodium carbonate solution introduced into the small intestine lowers the hydrogen ion concentration of the blood from pH 7.4 to pH 7.48. S. P. and H. A. Reimann<sup>11</sup> have seen a rise in the blood bicarbonate following the administration (by mouth) of ten to fifteen grammes of sodium bicarbonate. There are data which indicate that the composition of the blood undergoes changes when digestive juices of different composition are secreted, mixed with the chemical compounds of the food and re-absorbed by the mucous membrane of the alimentary tract. Only a systematic study of all these factors will establish their influence on the movements of the gastro-intestinal canal, (cf. Babkin<sup>1</sup>).

Thus, certain chemical substances, which are secreted by the digestive juices, or are present in the food masses, or are formed from them, *i.e.*, the natural chemical stimuli, form a group of exogenous chemical stimuli affecting the motility of the alimentary canal. But when we turn to the explanation of the action of the natural chemical stimuli we must consider factors of a different order, *i.e.*, the automaticity of the alimentary canal. The fact that parts of the alimentary canal, removed from the body and

kept in a suitable medium, produce spontaneous movements, indicates that certain endogenous factors acting within the walls of the gastro-intestinal tract itself are responsible for its motility.

There has been no systematic study of the interrelations between the exogenous and endogenous factors affecting gastro-intestinal movements. But the way in which this investigation may go is indicated by two groups of recent researches. These are: the application of the gradient theory elaborated by Alvarez to the movements of the alimentary canal, and the study of action of cholin on the gastro-intestinal tract by Magnus and his pupils.

According to Alvarez,<sup>12</sup> the graded difference in rhythmicity, irritability, and tone, and in the latent period of different parts of the tract determines an aboral movement of the food masses, because the pressure exerted on a bolus is greater on the upper than on the lower side. If the normal gradient is upset by disease as in inflammation, ulcers, etc., then the movements of the food masses may be retarded or increased or reversed.

I do not intend to discuss Alvarez's theory. I should like, however, to quote a few instances where certain phenomena in the alimentary canal may be satisfactorily explained by it in connection with the action of natural chemical stimuli.

We know that every one and a half to two hours, in the fasting condition, the duodenal juices regurgitate into the stomach. In other words, the movement of the intestinal contents is now in a reverse direction. This may be explained by the fact that the tone of the stomach drops below that of the duodenum, as Alvarez suggests.

But why is the tone of the duodenum now higher than the tone of the stomach? The probable explanation is that the alkaline duodenal juices increase the movements of the duodenum and, perhaps, of the pyloric part of the stomach, and do not influence the cardiac part or even inhibit its motility (cf. Kupaloff's<sup>13</sup> data concerning the influence of intravenous injection of different electrolytes on the motility of the stomach).

With the action of the natural chemical stimuli and the reversal of gradients, one can also explain the peculiar relations observed when fat is given. In this case there is always

a regurgitation of duodenal juices into the stomach. The cause of this phenomenon is probably as follows: fat inhibits the movements of the stomach and the secretion of acid gastric juice. On the other hand, soap induces strongly motility of the duodenum. The gradients change their relative positions: now the duodenum is more active than the stomach, and the duodenal contents regurgitate into the stomach.

**Cholin.**—According to Magnus and his pupils,<sup>14</sup> the walls of the gastro-intestinal tract contain a special substance, cholin, (Trimethyloxethylammoniumhydroxide), which is probably responsible for the automaticity of this organ. Cholin in physiological doses acts on Auerbach's plexus in the intestine. Preparations freed from Auerbach's plexus are stimulated only by far greater doses, which cannot be looked on as physiological. Injection of cholin into the blood increases the movements of the alimentary canal. The stimulating action of cholin on the gastro-intestinal tract seems to be specific, because it inhibits the heart contractions (vagus action).

The source of cholin is unknown. Its amount does not diminish in starvation and the cholin content of the intestine is normal in animals whose adrenals are extirpated. (The cortex of suprarenals contains cholin). Thus, cholin is a powerful normal endogenous stimulus of the motility of the alimentary canal. (Recently Mulinos<sup>15</sup> and Carlson, Smith and Gibbins<sup>16</sup> have expressed a doubt that cholin is the normal stimulus to motility of the gut).

From the point of view of the study of the action of the natural chemical stimuli the fact is very interesting that acetylated cholin in the form of acetyl-cholin, has an action 10,000 times stronger on the heart, and 2,500 times stronger on the intestine. As the contents of the intestine during digestion seem to be slightly acid, this fact can not be over-emphasized. (According to Grayzel and Miller<sup>17</sup> the  $pH$  of the intestinal contents of a dog on a mixed diet is from 5.91 in duodenum to 6.84 in colon).

#### CONCLUSION

From the data reported in this paper one may draw the conclusion that the chemical substances

usually present in the chyme play a very important part in the motor activity of the alimentary canal. They may change the excitability of the neuro-muscular apparatus of the gastro-intestinal tract, activate or inhibit the existing movements, or initiate new movements, often peculiar for a given chemical stimulus.

We must take into consideration the fact that the motility of the alimentary canal is influenced: (1) by the nervous impulses arising from the central nervous system; (2) by the acid-base equilibrium and ion balance of the blood; (3) by the hormonal composition of the blood; (4) by endogenous chemical stimuli of the alimentary tube itself (metabolites, cholin); and is activated by (a) mechanical stimuli and (b) chemical stimuli (natural chemical stimuli), supplied by the food masses and digestive juices.

To understand the factors regulating the gastro-intestinal motility, each of them must be studied separately. The natural chemical stimuli deserve no less attention than the rest of the factors determining the activity of the alimentary canal. And, only after a careful study of the separate problems raised by the question of the causation and variation of the movements of the stomach and intestine can a synthesis of our knowledge take place, such as to make possible the control of these movements.

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## GASTRO-COLIC FISTULA

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IN the carrying out of routine gastro-intestinal examinations, certain pathological lesions present themselves with almost clock-like regularity. To discuss any of these with you to-day would, we feel sure, be similar to carrying coals to Newcastle. From our viewpoint, fortunately, the occasional case is presented which has an unusual clinical history, and exhibits very interesting radiological evidence. These cases, owing to their marked variation from the ordinary, are indeed very intriguing, and grant a respite from the endless diagnosis of gastric ulcer, gastric cancer, and colonic carcinoma so frequent in the daily round of the radiological worker in gastro-intestinal disease.

At the risk of being accused of a flair for the bizarre, we take this opportunity of presenting to-day a few of these cases that it has been our good fortune to observe. The type of lesion we refer to is gastro-colic fistula. From our observations and a review of the literature on the subject, we feel the diagnosis of these cases from a clinical standpoint is not easy. That many of them are not recognized before autopsy is also true.

In 1857, Murchison published the first contribution to the literature on this subject. In 1900, Zweig<sup>1</sup> was able to find 70 cases reported; of this number only eleven had been diagnosed during life. Koeh,<sup>2</sup> Chavannaz,<sup>3</sup> Roger and Minuet observed this lesion and contributed to the literature about the same time. Bee<sup>4</sup> in 1897 reported a series of cases, and attempted a classification based on the etiology and anatomical situation of the primary disease, as follows:

1. Where the primary lesion was gastric.
  - (a) Gastric carcinoma ..... 35 cases
  - (b) Gastric ulcer ..... 12 cases
  - (c) Gastric tuberculosis ..... 1 case
2. Where the primary lesion was in the colon.
  - Carcinoma ..... 8 cases
3. Where the primary lesion was outside the gastro-intestinal tract.
  - (a) Abscess of the peritoneal cavity ..... 5 cases

(b) Tuberculous peritonitis . . . 1 case

Voorhoeve,<sup>5</sup> in 1912, found that 105 cases of this lesion had been recorded, and in his article remarks that Dietrich states that 3.75 per cent of all carcinomas of the stomach present this complication. In addition to this, Britton observed eleven gastro-colic fistulae in 507 autopsies for gastric carcinoma. Since 1912 four cases have been reported by Saucerotte,<sup>6</sup> four by Strauss,<sup>7</sup> three by Clairmont,<sup>8</sup> one each by Burnham,<sup>9</sup> Axtell,<sup>10</sup> Haudeck,<sup>11</sup> Nahan,<sup>12</sup> Neuman,<sup>13</sup> Minkowski,<sup>14</sup> Groeschel,<sup>15</sup> Limbart<sup>16</sup> Heinz,<sup>17</sup> Noordenbos,<sup>18</sup> Firth,<sup>19</sup> Pratt,<sup>20</sup> Massachusetts General Hospital,<sup>21</sup> and Hill.<sup>22</sup> Today, we are contributing our six cases of gastro-colic fistulae; one due to gastro-jejunal ulcer; two complicating gastric carcinoma; two secondary to colonic carcinoma; and one due to misadventure.

In an attempt to substantiate the classification given by Bee, the etiology of all the cases recorded was examined. We find that gastric carcinoma was the most frequent primary factor, 53 cases of the 130 recorded being secondary complications to this disease. Gastro-jejunal ulcer, following the operation of gastro-enterostomy, gave the second highest number of cases, with colonic carcinoma ranking third. The remaining cases were divided as to their etiology between tuberculosis of the stomach, bowel, or peritoneum, abscess of the peritoneal cavity, stab wounds, accidents of surgery, and congenital abnormalities. It is interesting to note at this point that, with one exception, all of the cases were in the male sex.

The two cardinal symptoms of gastro-colic fistula are fecal vomiting and lienteric diarrhoea. If we were dealing with a primary disease, the diagnosis of the lesion from these symptoms would indeed be easy. We must remember, however, that gastro-colic fistula is not a primary disease, but, rather, a secondary complication grafted upon the primary lesion, and the symptoms are added more or less insidiously to the symptoms of the pre-existing disease. A patient

suffering with a carcinoma of the stomach may have vomiting, and, according to Osler, not infrequently diarrhoea. Many of us have observed in such cases a marked hypermotility of the large bowel. The fistula will only be suspected with the change in type of the vomiting and the diarrhoea. The first vomitus contained food-remnants and altered blood; on the formation of the fistula the vomitus becomes faecal in character. The diarrhoea at first bears no relation to food, but now comes on immediately after eating and contains undigested food.

The gastro-colic fistula following upon a gastro-enterostomy is preceded by the symptoms of gastro-jejunal ulcer. The epigastric pain, not relieved but often increased with the ingestion of food, and not relieved by alkalies, points to the development of a gastric lesion, rather than to the return of the duodenal disease for which the gastro-enterostomy had been performed. Vomiting and hypermotility with diarrhoea will often accompany a gastro-jejunal ulcer, particularly if the stoma is of large calibre, with a rapid emptying of the gastric contents into the small bowel. It is only with the increase of pain, the demonstration of faecal matter in the vomitus, and the onset of the lienteric type of diarrhoea that the formation of a gastro-colic fistula will be suspected.

The gastro-colic fistula following carcinoma of the colon is also very difficult of recognition. Loss of weight, vomiting, diarrhoea, alternating with constipation, will all be present. When the vomiting becomes faecal, our first thought will naturally be that obstruction has taken place, but the persistent diarrhoea of a lienteric type (with undigested food) shows that no obstruction has occurred. This, combined with the stereoraceous vomiting, should place us on the *qui vive* as to the complication present. The rare case will occasionally be observed in which all these signs are absent, as in the one recorded by Aron. Again, the symptoms may be observed for a very short period, and then entirely disappear, as in the case reported by Firth.

The radiological examination is of the very highest value in the diagnosis of gastro-colic fistula. By this method, the primary disease may be demonstrated, the exact site of the fistula will be established, and in the case without the cardinal symptoms, x-rays offer the only means of arriving at a correct conclusion.

We would state that in only one of our six cases was the lesion suspected before the radiological examination was carried out. To Haudek belongs the honour of first demonstrating a gastro-colic fistula secondary to gastric carcinoma in the absence of a clinical diagnosis; and to Burnham, for the first demonstration of this lesion secondary to colonic carcinoma, without any clinical diagnosis having been arrived at previously. Both the barium enema and the barium meal should be used in examination when a gastro-colic fistula is suspected. It will be observed in a certain number of cases that the enema will flow through the fistula into the stomach, but none of the meal passes directly into the colon, on account of the fistula being of a valve type. Falta reports such a case, and in our series a similar observation was made. On the other hand, the meal may pass directly from the stomach through the fistula into the colon, but upon administering the enema none of the enema will be discharged into the stomach. One case in our series presented this finding.

#### CASE 1

Male, aged 35. Seven years previous to the present illness a gastro-enterostomy had been done for the relief of a duodenal ulcer. The symptoms were relieved until six months before our examination. At that time he had complained of epigastric pain, not relieved by food, but often aggravated by it. Alkalies gave no relief. The presence of a gastro-jejunal ulcer was



FIG. 1.—Gastro-colic fistula following gastro-enterostomy. Note the transverse colon well outlined. (Case 1.)

suspected and he was placed upon suitable treatment. He did not obtain relief, and vomiting became persistent, accompanied by diarrhoea. At the examination with the barium meal, the stomach filled well, except at the stomal site. The caput showed a constant deformity, due to the old duodenal scar. The gastro-enterostomy was functioning freely, but one could also see the barium passing into the transverse colon directly from the stomach. (Fig. 1.) A diagnosis of gastro-colic fistula was given, which was further established upon a study of the serial plates. A laparotomy was performed, and a gastro-jejunal ulcer was found. Leading from the site of this, a fistulous tract was demonstrated, entering the transverse colon. This was resected, the colon closed, a new gastro-enterostomy done, and the patient made an uneventful recovery.

#### CASE 2

Male, aged 49. This patient had complained of vague gastric symptoms for three months; loss of weight was noted and some anaemia. About ten days previously to examination he complained of vomiting at irregular intervals, and twice noticed that the vomited material had a faecal odour. On questioning him carefully, one could not elicit a history of enteric diarrhoea.

The barium meal was administered. On the screen the stomach was well formed, except for a mid-gastric area where a constant filling defect was noted. The pylorus was smooth and regular. The caput was easily visualized, and the barium could be seen passing into the jejunum. No passage of barium into the colon through the fistula could be seen. (Fig. 2.) On studying



FIG. 2.—This plate was made after the barium meal. The defect due to carcinoma can be seen in the stomach, but none of the barium passed into the colon. (Case 2.)

the serial plates, no evidence could be detected of the opaque salt in the colon. When the barium enema was administered, the sigmoid and descending colon filled well and were normal. The splenic flexure showed no defect, and the enema flowed easily through the transverse colon. At a point in the transverse colon about four inches from the splenic flexure fistula could

be seen leading directly to the filling defect previously seen in the stomach, and the stomach soon filled from the enema. (Fig. 3.) A diagnosis of gastro-colic fistula.

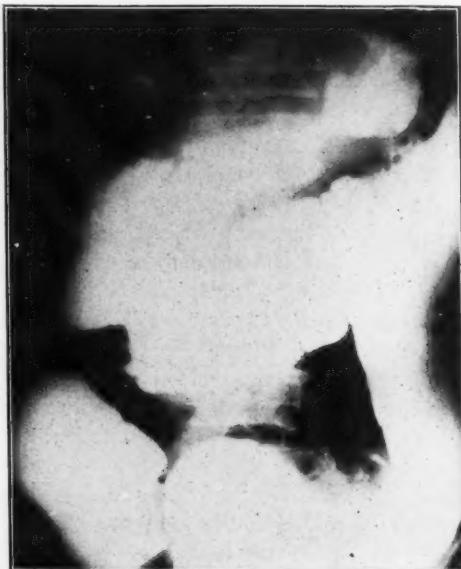


FIG. 3.—Stomach filled through fistula on administration of barium enema. (Case 2.)

complicating gastro-carcinoma, was given. At operation, a mass about the size of an orange was found on the posterior wall of the stomach. On section, this proved to be adeno-carcinoma. Leading from this, the fistula was demonstrated in a mass of adhesions, opening into the transverse colon. The patient succumbed about three months later.

#### CASE 3

Male, aged 52. The patient was much emaciated, pale and sallow, and complained of diarrhoea alternating with constipation. Lately, the diarrhoea had become more persistent and followed food. Vomiting had been present for about two weeks; recently, the odour had been faecal. On examination of the stool, food particles were present. The clinical diagnosis was carcinoma of the colon. A barium enema was given. The sigmoid and descending colon filled quickly and no defect was noted. About three inches proximal to the splenic flexure in the transverse colon, a circular filling defect was seen; passing from the upper limit of this could be demonstrated a fistula through which the stomach quickly filled. None of the enema passed beyond the obstruction in the colon. A diagnosis of gastro-colic fistula, secondary to carcinoma of the colon, was made. The patient refused operation. At autopsy, an annular carcinoma was found in the transverse colon. Passing from the site of involvement was a fistula, which at the upper end had perforated into the posterior wall of the stomach.

#### CASE 4

Male, aged 40. This patient showed some loss of weight, a dry harsh skin, and considerable pallor. Six months previously he had been seized with a sudden pain in the upper left quadrant. He had been admitted to hospital at this time, and from the clinical evidence a diagnosis of pleurisy had been recorded. Stereoscopic plates of the chest were made, but on examination were negative. All symptoms subsided and the patient was discharged. Unfortunately, no gastro-intestinal examination was requested during this admission to hospital.

At the time of his second admission he complained of loss of weight, weakness, diarrhoea, and vomiting. On examining the vomitus, it was of definitely faecal type. A barium enema was given. The lower sigmoid, pelvic colon, and descending colon, all showed a normal appearance. At a point about three inches proximal to the splenic flexure a marked filling defect could be seen. Leading from this a definite fistula could be demonstrated, entering the stomach in the posterior wall. (Fig. 4.) A second fistula was demonstrated passing

different type from those just reported. About six weeks previously we had examined the patient, and found a duodenal ulcer. His attending physician advised a gastro-enterostomy for relief of this condition. An operation was done, but the speedy relief of symptoms did not materialize. Rather, the symptoms became worse; vomiting was persistent, diarrhoea was marked; and the patient was losing ground. Suspecting that some untoward condition had developed at the site of the anastomosis, the case was referred for a second x-ray



FIG. 4.—Stomach filled by the passage of the enema through the fistula. (Case 4.)

into the upper coils of the jejunum. A diagnosis of gastro-colic and jejunoo-colic fistulae was made. A laparotomy was done, but the patient's condition was such that no repair could be attempted. He died about six hours after the operation. At autopsy, a large carcinoma was found in the transverse colon; a fistula was present passing to the posterior wall of the stomach, and, branching from this, a fistula passed through the mesocolon and perforated into the jejunum, which was matted against its inferior surface.

#### CASE 5

Male, aged 70. This patient was referred with very vague gastro-intestinal symptoms. No definite clinical picture was present, although the general history was in favour of gastric carcinoma. A barium meal was given. The stomach filled well. On the posterior wall, close to the greater curvature, a constant filling defect could be seen. Leading from this a fistula was present, communicating with the transverse colon. (Fig. 6.) On the serial plates the same conditions were noted. When the barium enema was given, none of the elysma passed through the fistula, the colon presenting a normal appearance. A thorough catharsis was given and a second meal administered. The observation made at the first meal was verified, and the fistula very well outlined. A diagnosis of gastro-colic fistula was given. The patient refused operation. We are at the present keeping in touch with the case, and from present appearances it will not be long until we will be able to report the autopsy findings.

#### CASE 6

Male, aged 32. This case is one of an entirely



FIG. 5.—Note the filling defect on greater curvature. The fistula can be seen leading from this defect to the colon. (Case 5.)

examination. Whether it was due to a desire for speed at the expense of accuracy, or a desire to ensure a good function of the stoma, or just sheer lack of anatomical knowledge, we do not know, but you can imagine our surprise to find instead of a gastro-enterostomy, a very successful gastro-colostomy had been done. A second operation was undertaken. The fistula was closed, and a gastro-enterostomy done. The patient made an uneventful recovery.

#### CONCLUSIONS

1. Gastro-colic fistula occur more frequently than we have been led to believe.
2. They more frequently follow carcinoma than gastro-jejunal ulcer; carcinoma of the stomach giving a higher percentage than colonic carcinoma.
3. A sudden change in the symptoms, particularly in the type of vomiting or diarrhoea, should put us on the *qui vive*.
4. The radiological examination offers the best method for accurate diagnosis of the condition.

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## OBSERVATIONS ON THE FORM OF THE NORMAL GALL BLADDER

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IN the course of a number of routine post-mortem examinations it was observed that the gall-bladder varied markedly, not only in size, but in form. Reference to anatomical text-books revealed a more or less uniform description of the viscus, the best account found being that in the manual of Poirier and Charpy. The literature contains many papers on abnormalities of the bile-ducts, and on pathological conditions of the gall-bladder, but very little about the shape of the normal organ. The contributions of Faure<sup>1</sup>, Dévé<sup>2</sup>, Schachner<sup>3</sup> and Boyden<sup>4</sup> are perhaps of greatest value. The most recent paper is that of Karlmark<sup>5</sup>.

Twelve gall-bladders were secured in the post-mortem room from bodies which were examined within three hours after death. Cases were selected in which there was no history of biliary or hepatic disease, and in which the liver and gall-bladder appeared normal. In each case the whole of the cystic duct and part of the hepatic and common ducts were obtained. The specimens were dissected free of fat and other tissue. An incision was made in the fundus, and the parts washed in water until free of bile. No calculi or other evidences of disease were found. Next a glass tube was tied in the fundal incision, the gall-bladder distended with air, and the hepatic and common ducts and the fundus were tied off. The distended gall-bladder was left hanging in air for 48 hours, or until dry. Small segments of the wall were removed, to reveal the internal structure of the viscus, and the cystic duct was opened up along its entire course.

The most interesting feature of the dried gall-

bladders is the presence, in most cases, of folds in the mucous lining, which appear as very thin partitions or shelves. These vary in form from incomplete crescentic rings, projecting a few millimetres only, to veritable partitions obstructing  $\frac{3}{4}$  or more of the lumen (Fig. 2). It seems possible that Dévé's case may have been an extreme instance of this. It showed a complete



FIG. 1.—Normal gall bladder with a relatively straight cystic duct.

partition separating the fundus from the body, the cavity so formed containing a whitish fluid. The shelf may be close to the orifice of the viscus, and when in this position may be considered as the commencement of Heister's spiral valve of the cystic duct; or it may be situated at almost the mid point of the gall-bladder, in which case the exterior sometimes presents a marked sulcus at the level of the shelf (Fig. 2). Boyden's Fig. 8B is very much like this. There may be 1, 2 or 3 definite shelves visible in one gall-bladder, and sometimes one runs into another at an angle. Several of Faure's casts show a similar formation. Histologically, these folds are seen to consist of mucous membrane and connective tissue.

Of the twelve gall-bladders examined, three possessed straight cystic ducts, without shelves, (Fig. 1). In the other nine the cystic ducts were tortuous, the most marked example being shown in Fig. 3. Of these nine, two had no shelves, three had one shelf at the beginning of the cystic duct, and four presented two shelves, one at the origin of the cystic duct and one at some distance from it, thus forming a "pouch." Fig. 2 exhibits the best marked of these.

Thinking that this was the condition described by Hartmann, and since referred to as "Hartmann's pouch," we read his original article<sup>6</sup>. He describes a "grande poche," containing a

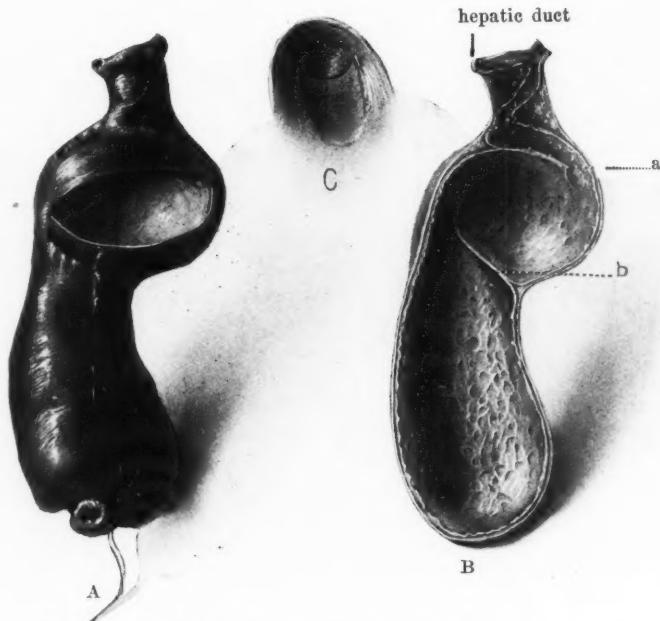


FIG. 2.—Normal gall bladder, with well marked shelves at *a* and *b*. At *C* is shown a view of the proximal surface of shelf *b*.



FIG. 3.—Normal gall bladder with a very tortuous cystic duct (shown by dotted arrows).

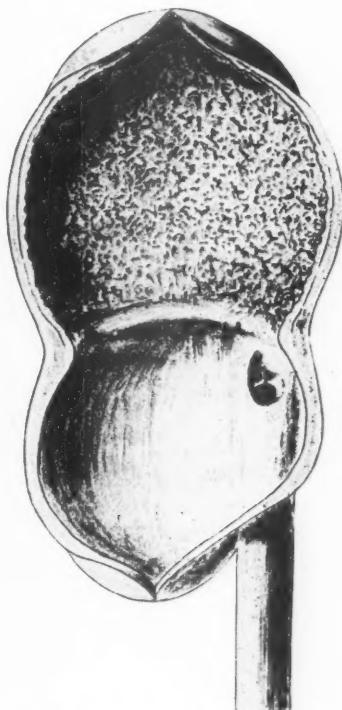


FIG. 4.—Reproduction of Hartmann's illustration of a pathological gall bladder which contained a large stone in the "grande poche" or lower loculus.

large single gall-stone, situated "au dessous de l'abouchement du canal cystique" (Fig. 4). The condition portrayed would appear to be the result of a pathological process and to bear little or no relation to the normal shelves described in the present article. In this connection, it is of interest to note that Fowler, in discussing McMahon's<sup>7</sup> case, states that hour-glass gall-bladders are rather common, but that in his experience the hour-glass is always the result of an inflammatory process.

Inquiry from a number of surgeons as to their observations of such shelves at operations on the gall-bladder elicited two replies in the affirmative. One of these surgeons, Dr. F. N. G. Starr, of Toronto, further stated that he had seen such a condition with the fundal part containing several stones, there being none in the proximal portion.

From a study of these specimens, it seemed evident that these shelves are normal structures, probably without function other than that of

increasing the surface area of mucous membrane. In the soft state they were too delicate to offer much resistance to the passage of a calculus, and yet it is conceivable that a calculus might exist in one of the loculi for years, without being able to move either way, and without causing symptoms.

The illustrations for this paper were prepared by Miss M. T. Wishart and I wish to thank her for the care and interest shown. I also desire to thank Dr. E. A. Linell for much assistance in the preparation of both the material and the paper.

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## A CASE OF ACROMEGALY

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THE following case of acromegaly is reported, not because of any unusual features, but because it is a classical example of a disease seldom encountered in the clinics of this hospital, presenting practically the entire gamut of clinical signs and symptoms so well worked out by Cushing and his school.

V. M. is a French-Canadian of 53 years, who came to the medical out-patient department of the hospital in September of this year, complaining of pains in the loins, back and legs, sweating and shortness of breath.

The family history is of some interest. The father of the patient was a large man, weighing at times as much as 290 lbs. Two brothers and two sisters, alive and well, are not exceptionally large, but the patient has a son who is over 6 feet tall.

The patient does not recall any of the ordinary diseases of childhood. He denies venereal disease. He was married early in life and has a healthy family of five, the youngest being a son twenty-four years of age. He does not use alcohol but

smokes cigarettes to excess. At the age of fourteen he weighed 160 lbs.; his heaviest weight was 290 lbs.; and his present weight is 249 lbs.

The time of onset of the present illness is indefinite. For a number of years—perhaps ten—he had been troubled with shortness of breath on exertion, and excessive sweating. He was, however, able to continue at his work as a carpenter until five years ago, when he began to suffer from aching pains down his legs, in his back, and in his groins. About the same time, he became stooped, and because of this and the pains in his legs and back, he was forced to seek the assistance of a cane when walking. About this time he first suffered from frontal headaches. His appetite had always been good and the bowels regular. In recent years he had noticed an increasing difficulty in biting his food, owing to the forward growth of the lower jaw, which prevented the upper and lower incisors from coming into apposition. He had not noticed any recent increase in the size of the hands or feet, which, he states, have always been large. He wears a

$7\frac{3}{4}$  hat and an 11 shoe. During the past three years his eyesight had been failing. He has been conscious of the loss of libido for some years. The legs have never been swollen, nor has he had attacks of vertigo or fainting.

#### PHYSICAL EXAMINATION

The patient was a huge man, short-necked, and very stooped, but not unusually tall. He had a large head for his size, and the face was oval, due to the prominent lower jaw. When the



FIG. 1.—Photograph of patient and his hand.



FIG. 2.—Note the broad palm and fingers, as compared with the normal hand.

Jaws were closed the lower incisor teeth were seen to underride the uppers by three-quarters of an inch. The upper incisors showed no unusual spacing. The hands appeared large, due to the width of the palm and the stubby, rather square-tipped, fingers. His walk resembled the rolling gait of a seaman.

The thorax was huge and deep. The thyroid was not enlarged to palpation. The lungs were clear. The pulse was 76, regular, and of a good quality. The relative cardiac dullness measured 17.5 c.m. to the left, but the blood pressure was

only 110-70. The heart sounds were distant, though clear.

The abdomen was large and pendulous. The liver extended two fingers'-breadths below the costal margin, but the spleen did not appear to be enlarged. There was no ascites.

The reflexes were normal. Though the legs were large there was only slight oedema of the feet.



FIG. 3.—X-ray picture of the patient's head. It shows the prognathos of the lower jaw, and the enlarged pituitary fossa.



FIG. 4.—X-ray picture of a normal skull. Compare the size of the pituitary fossa with that of the patient.

#### LABORATORY FEATURES

The urine was always of normal specific gravity and in other respects also was negative. The blood picture was normal. The Wassermann was negative. The basal metabolic rate was plus 28. The sugar tolerance test was positive. After the administration of 100 grams of glucose the blood sugar rose to 0.196 per cent, and glycosuria was noted at the end of the second hour.

The skiagram of the skull showed marked development of the frontal and occipital areas, with thickening of the tables and a very large pituitary fossa. No erosion of the clinoid processes was noted. There was a marked degree of prognathos of the lower jaw. The skiagram of the vertebrae showed evidence of hypertrophic changes in all. The plates of the hands and feet showed enlargement of the bones, with fanning out of the terminal phalanges. The fields of vision and the fundi were reported to be normal.

#### DISCUSSION

The cause of the acromegaly in this instance, as in the vast majority of cases, is probably a chromaphile adenoma of the anterior lobe of the pituitary gland. Tumours of the pituitary gland, according to Cushing, invariably arise from the anterior lobe. They are either chromaphobe or chromaphile in type, depending upon the order of the cells from which they arise. These adenomas may be differentiated clinically according to the symptom-complex to which they give rise. The chromaphobe adenomas do not elaborate the growth stimulating secretion, and consequently do not lead to the acromegalic syndrome. They produce the signs and symptoms of local pressure, notably headache, and blindness of the bitemporal type. The patients seek relief from these symptoms, and it is in these cases that operation for the relief of local pressure is imperative, if sight is to be saved. The sufferers from chromaphile adenomas, on the other hand, rarely seek medical advice because of local pressure. Long before the tumour has reached a sufficient size to produce blindness, the internal secretion which it elaborates produces the symptom-complex which is so completely illustrated by this case. If the onset is before ossification of the epiphyses, gigantism is the result. If after, the more perverted type of growth is produced. Acromegalics frequently suffer most from the visceral splanchnomegaly, and not a few cases have died from myocardial failure associated with *cor bovinum*. In the case here reported the patient

had suffered from dyspnoea on exertion for a number of years, and on examination, though the systolic blood pressure was only 110, the relative cardiac dullness measured at least 17.5 c.m. Many suffer extreme neuritic pain, caused by pressure of the hypertrophic vertebral processes upon the nerves as they emerge. Only a few actually make their first appearance in the clinic because of the headache and blindness, which is in striking contrast to the other type. In well-developed cases the laboratory features are quite characteristic. The increase in the basal metabolic rate is due to the hyperthyroidism which results from hyperpituitarism. The diminished sugar-tolerance is explained on the basis of perversion of its internal secretory mechanism, as are the amenorrhoea and loss of libido.

The results of treatment are far from satisfactory. Deep radiation of the hypophysis has been tried, but has not yielded results of any consequence. It is now employed only as a preoperative measure. Partial destruction by operation is attended by considerable success, but unfortunately it is not permanent. Cure is not to be expected, as the whole lobe cannot be removed. Cushing has reported 291 operations on the pituitary gland, approaching it by the trans-sphenoidal route in 253 instances, and in the remainder by the trans-frontal method. The direct operative mortality in either method is in the neighbourhood of 5 per cent. The immediate result of the operation in the cases which survive, is striking. There is a rapid diminution in weight and size. The basal metabolic rate falls to normal, and a greater tolerance for sugar develops. In women, the menstrual habit is established, and fertility restored. This period of health lasts from five to fifteen years, after which there is a gradual return of the symptoms. Operation is not a procedure to be lightly advised, if only because of the myocardial degeneration usually present. It is an imperative procedure only in the presence of definite signs of local pressure. For these reasons operation in the case here reported is contra-indicated.

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**The Frequency of Cancer in Tropical Races—**  
Dr. J. Snijders gives some data on the incidence of cancer, collected from the records of five hospitals on the East coast of Sumatra. The proportion of cases of cancer of the liver (primary) is very high among male and female

Javanese and male Chinese, there being 41 such out of a total of 77 cancer cases. Dr. Snijders concludes that cancer is as frequent in Sumatra among the Chinese and Javanese as it is in Europe.—*Office International d'Hygiène Pub., Bull. Mensuel*, 1927, xix, 926-930.

THE USE OF SODIUM CHLORIDE, POTASSIUM CHLORIDE,  
SODIUM BROMIDE, AND POTASSIUM BROMIDE IN  
CASES OF ARTERIAL HYPERTENSION WHICH  
ARE AMENABLE TO POTASSIUM CHLORIDE

By W. L. T. ADDISON, B.A., M.D.

Toronto

THIS paper is a further report of clinical experiments in arterial hypertension, commenced in 1923, and reported in *The Canadian Medical Association Journal* in 1924 and 1925.<sup>1</sup>

J. B. S. Haldane<sup>2</sup> has shown that in an attempt to maintain the acid-alkali-balance of the tissues, the inorganic acidosis producing salts (calcium and ammonium chlorides), when administered in sufficient quantities, bring about a marked increase of ammonia and soda excretion as the acid phosphates.

Bunge,<sup>3</sup> has shown, by experiments on himself, that potassium phosphate and potassium citrate increase the soda excretion by one-third of the potash taken.

Blume,<sup>4</sup> of Paris, asserts that potassium chloride displaces sodium chloride, to cause a diuresis and an increase of soda excretion.

A large and increasing body of evidence tends to prove that the soda ion is a sensitizer of nerve and muscle function; a less, but increasing, body of evidence tends to show that the potassium ion, (while its action on the heart is in some ways similar to that of the soda ion) acts as a nerve depressor.

To summarize, calcium chloride produces an inorganic acidosis, with increased excretion of ammonia and soda; potassium chloride, without change of the acid-alkali ratio, gives an increase of soda excretion; potassium citrate produces an alkalosis, with an increased soda excretion; and all three, with proper dosage, reduce arterial pressure in the large majority of cases of hypertension.

In view of this summary, it was decided in 1925 to try the action of potassium and sodium chlorides in the same person, and, lest the chlorine be thought a party to the action, the experiments were repeated with the respective bromides. The tests with potassium citrate were added to Cases 4 and 5 as an after-thought in reviewing Case 1.

The patients upon whom the experiments were carried out were on a salt-poor diet, from which meat, poultry, eggs, cheese, beans, peas, and nuts were excluded. They were allowed fish once daily; vegetables, fruits, cereals and milk freely. These patients, with the exception of the later period of Case 1, carried on under their ordinary living conditions. Cases 1 and 2 did not know of the experimental nature of their treatment. Cases 3, 4, and 5 knew of the purpose of the treatment.

In five cases the tests were made and are here reported:—

CASE 1

Mr. McA., aet. 64, was reported in 1924 as Case No. 13. The report, then, was as follows: Slight albuminuria, oedema of the ankles and lower eyelids.

Oct. 29, 1923—Blood pressure: systolic, 182; diastolic, 128. Urine: specific gravity, 1015. Gave calcium chloride, grs. 180 *per diem*.

Oct. 31st—Blood pressure: systolic, 162; diastolic, 110.

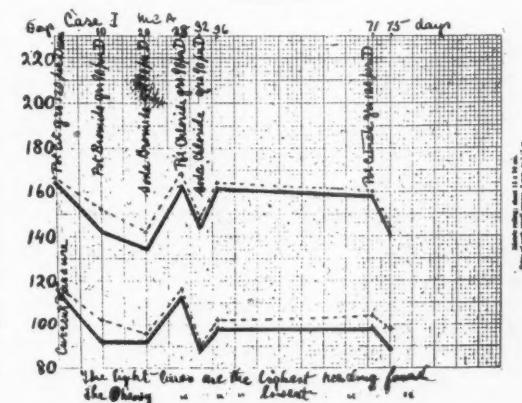
Nov. 5th—Blood pressure: systolic, 174; diastolic, 110.

Nov. 19th—Blood pressure: systolic, 168; diastolic, 112. Albumen and oedema were absent; treatment continued for three weeks, but the results were not reported.

May 3, 1924—Blood pressure: systolic, 134; diastolic, 80. (Urine: specific gravity, 1025. (Had been on a low meat diet, using milk freely).

1926—I saw him at his home. He had general oedema, dyspnea, some cyanosis and vertigo, some delirium and delusions, no convulsions or coma, but ap-

CHART I



parently he was in the early stages of uræmia. His urine varied from 1010 to 1014, and was scanty in quantity. The initial blood pressure was lower than in 1923, but the clinical symptoms were graver.

*April 30th*—Blood pressure: systolic, 164-166; diastolic, 116-118. Put on potassium citrate, grs. 120 *per diem*.

*May 12th*—Blood pressure: systolic, 154-142; diastolic, 102-92. Put on potassium bromide, grs. 90 *per diem*.

*May 25th*—Blood pressure: systolic, 142-134; diastolic, 96-98. Put on sodium bromide, grs. 90 *per diem*.

*June 2nd*—Blood pressure: systolic, 168-162; diastolic, 116-112. Put on potassium chloride, grs. 90 *per diem*.

*June 6th*—Blood pressure: systolic, 148-146; diastolic, 90-88. Put on sodium chloride, grs. 90 *per diem*.

*June 14th*—Blood pressure: systolic, 160-158; diastolic, 112-108.

*July 27th*—Off treatment for two weeks. Blood pressure: systolic, 160-158; diastolic, 104-100. Put on potassium citrate, grs. 90 *per diem*.

*July 31st*—Blood pressure: systolic, 146-140; diastolic, 98-92.

#### SUMMARY

He was put on potassium citrate, grs. 120 *per diem*, with a resultant rapid increase in the volume of urine, a decrease of the œdema and dyspnoea, and a slowly clearing mental condition. The potassium bromide improved his mental condition and lessened his vertigo. The sodium bromide produced nausea, caused a return of the œdema, and produced a rise of blood pressure. With the taking of potassium chloride the blood pressure receded, to rise again with the ingestion of sodium chloride. Associated with the rise of pressure there was a return of the dyspnoea, and to a lesser degree an increase of the œdema. He was seven weeks without treatment, and returned approximately to his current blood pressure, but on potassium citrate had a recession to a systolic pressure of 140 and a diastolic of 88. This case is of special interest, in that it shows the response of a chronic nephritis to (a) an acidosis-producing salt—calcium chloride; (b) an alkalosis-producing salt—potassium citrate; (c) a neutral salt—potassium chloride. As far as our present knowledge goes, the common effect of these three substances is the increased elimination of the soda, and the lowering of blood pressure, followed by relief from the symptoms. This experiment gives a reasonable basis for hypothesis that the toxic agent in this case of nephritis was an excess of the blood-sodium content.

#### CASE 2

Female, aet. 46. When first appearing the patient had a blood pressure of systolic, 188, and diastolic, 94, with dyspnoea, vertigo, œdema of the ankles and slight cyanosis. Under potassium chloride, grs. 90 *per diem*, her condition had so improved that, during the warm

season of 1926, her blood pressure approximated systolic, 130, diastolic, 80, after treatment had been dropped. With cold weather the hypertension returned.

Under experiment the following results were obtained:

*Dec. 17, 1926*—Current blood pressure: systolic, 170; diastolic, 98. Put on potassium chloride, grs. 120 *per diem*.

*21st*—Blood pressure: systolic, 160-140; diastolic, 94-82. Put on sodium chloride, grs. 120 *per diem*.

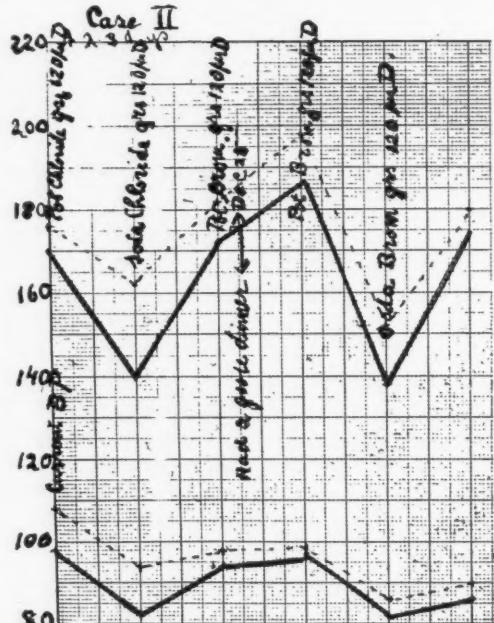
*24th*—Blood pressure: systolic, 182-172; diastolic, 98-94. Complained of basal and frontal headache. Put on potassium bromide, grs. 120 *per diem*.

*28th*—Blood pressure: systolic, 196-192; diastolic, 96-86. Had had a Christmas goose-dinner, with a headache following. Continued the bromide.

*30th*—Blood pressure: systolic, 152-138; diastolic, 86-82. Put on sodium bromide, grs. 120 *per diem*.

*Jan. 3, 1927*—Blood pressure: systolic, 180-176; diastolic, 90-86.

#### CHART II



Of further interest was an occurrence in 1925 when, for economy's sake in diet, she substituted beans for potatoes, with the result of a reversion to her previous blood pressure; a return to potatoes in her diet was accompanied by a remission of her blood pressure. The result of a goose dinner is seen on the chart. The recurrence of hypertension consequent on the taking of meat is frequently seen in our clinic.

#### CASE 3

Male, aet. about 65. This case, when first reporting, complained of vertigo, dyspnoea, and œdema of the legs. He had an initial blood pressure of systolic, 180-172; diastolic, 102-100.

During the warm weather, when on potassium chloride, grs. 120 *per diem*, his blood pressure approximated, systolic, 150; diastolic, 80.

The record of our experiments in this case is as follows:

Current pressure: systolic, 180-172; diastolic, 102-100. Put on sodium chloride, grs. 120 *per diem*.

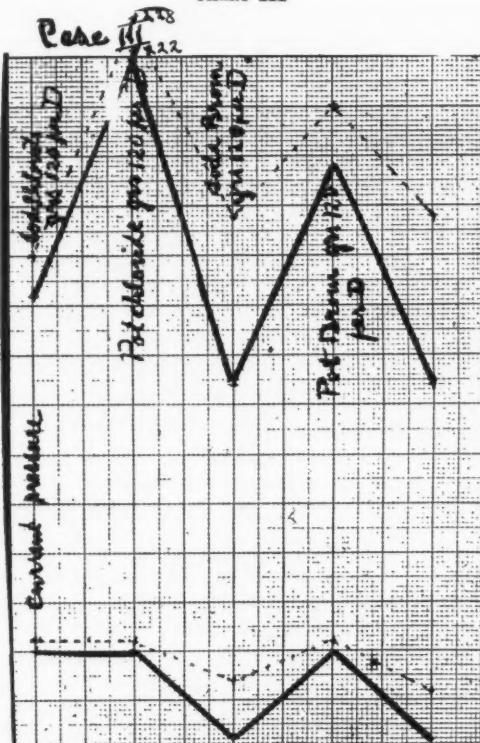
Four days later—Blood pressure: systolic, 228-222; diastolic, 102-100. Put on potassium chloride, grs. 120 *per diem*.

Four days later—Blood pressure: systolic, 188-156; diastolic, 96-84. Put on sodium bromide, grs. 120 *per diem*.

Four days later—Blood pressure: systolic, 210-196; diastolic, 102-100. Put on potassium bromide, grs. 120 *per diem*.

Four days later—Blood pressure: systolic, 186-154; diastolic, 92-82.

CHART III



On being placed on the sodium chloride his face and body developed edema, and he had headache, vertigo, dyspnoea, and a slight cyanosis. Though he did not know of the experimental nature of the treatment, he spoke of his well-being under the potassium chloride, of the drowsiness and comfort under the potassium bromide, and under the sodium bromide he complained of vertigo, dyspnoea, and of "feeling silly." He was decidedly ill with the soda salts and comfortable with the potassium salts.

## CASE 4

L. S. is a professional man of scientific training, who volunteered for experiment, knowing the risk and discomfort he would incur. May we not refer to him as of "the honourable company of gentlemen adventurers?" The records of the case are as follows:

Dec. 9, 1926—Current blood pressure: systolic, 188-162; diastolic, 110-98. Put on potassium chloride, grs. 120 *per diem*, which was taken with difficulty.

13th—Blood pressure: systolic, 166-150; diastolic, 90-82. Slept well when sleeping, but slept less time than usual.

14th—Blood pressure: systolic, 168-158; diastolic, 112-92. Put on sodium chloride, grs. 120 *per diem*.

17th—Blood pressure: systolic, 194-186; diastolic, 126-118. Was ill and had dyspnoea and vertigo. Put on potassium bromide, grs. 120 *per diem*.

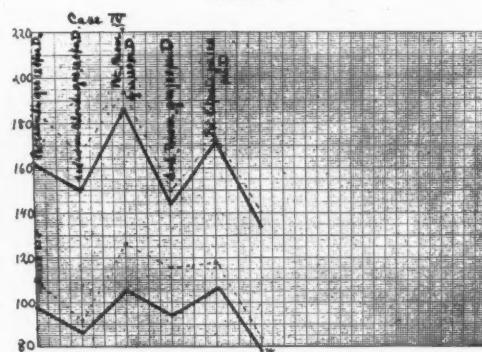
19th—Blood pressure: systolic, 148-144; diastolic, 110-104. Was comfortable and drowsy. Put on sodium bromide, grs. 120 *per diem*.

21st—Blood pressure: systolic, 176-172; diastolic, 118-116. Was ill of vertigo and dyspnoea.

21st—Put on potassium citrate, grs. 120 *per diem*.

24th—Blood pressure: systolic, 134; diastolic, 78.

CHART IV



His chart is here given, and it is seen that his hypertension is of a moderate degree, and the spread between the higher and lower readings would indicate a nervous temperament not obvious to his friends.

The potassium chloride produced a good recession in both systolic and diastolic pressures. The sodium chloride gave a marked rise in excess of his current hypertension, with irritability, dyspnoea, and vertigo, and he was quite ill. The potassium bromide, as is seen, gave the greatest recession of systole, though not so great a recession in diastole, as did the potassium chloride. The sodium gave a notable rise in systole with little spread in the readings, with a marked rise in diastole and marked vertigo, moderate dyspnoea, difficult enunciation of words, and an illness more profound than with the sodium chloride. With potassium citrate the drop in blood pressure was greater than with the chloride, and produced less gastric distress.

## CASE 5

This is my own, which I had hoped to work out at an earlier date, but any hypertension during the warm weather was of so transient a sort as to form a poor basis for experiment. That one had the experiment under one's own observation robbed it of risk, but one must own to an unhappy time when taking the soda salts. The experiments, as here carried on with frequent observations, are possible only under circumstances, or in a hospital, and should one carry them farther, the rising dose at frequent intervals and under constant super-

vision would be the method used. The preliminary tests with the chlorides were interrupted and the bromides of this set only given. To avoid interruption, a Saturday and Sunday were selected to complete the test with the chlorides and the citrate, and the increasing dose used, and these were worked out in 36 hours. To obtain a hypertension a substantial meat diet was taken for two days. The results are given below:

Dec. 19, 1926, 7 a.m.—Current blood pressure: systolic, 202-198; diastolic, 128-118. Put on potassium bromide, grs. 120 *per diem*. 1 p.m.—Systolic, 192-188; diastolic, 118-108. 9 p.m.—Systolic, 180-170; diastolic, 108-102.

20th, 6.30 a.m.—Blood pressure: systolic, 180-180; diastolic, 118-112. 1 p.m.—Systolic, 184-176; diastolic, 118-108.

21st, 6 a.m.—Blood pressure: systolic, 174-162; diastolic, 112-100. 7 p.m.—Systolic, 198-168; diastolic, 118-104.

22nd, 6 a.m.—Blood pressure: systolic, 164-152; diastolic, 110-102. 9 p.m.—Systolic, 178-152; diastolic, 112-106. Commenced soda bromide, grs. 120 *per diem*. Taking grs. 80 on retiring.

23rd, 6 a.m.—Blood pressure: systolic, 186-178; diastolic, 124-120. 9 p.m.—Systolic, 208-194; diastolic, 146-130.

24th, 7 a.m.—Blood pressure: systolic, 212-208; diastolic, 150-140.

Jan., 1926, 6 p.m.—Current blood pressure: systolic, 196-186; diastolic, 128-116. Took potassium chloride, grs. 40. 9 p.m.—Systolic, 188-186; diastolic, 114-106. Took potassium chloride, grs. 50. 3 a.m.—Systolic, 172-152; diastolic, 106-104. 10 a.m.—Took 40 grs. of sodium

chloride. Noon—Systolic, 168-162; diastolic, 118-108. Took 50 grs. sodium chloride. 3 p.m.—Systolic, 218-198; diastolic, 138-134. 5 p.m.—Took potassium citrate grs. 40. 7 p.m.—Systolic, 181-168; diastolic, 128-114. Took potassium citrate grs. 50. 9 p.m.—Systolic, 176-160; diastolic, 116-104. 6 a.m.—Systolic, 168-154; diastolic, 104-96.

The results in Case 5 are very similar to those in Case 4, except in the heavy rise of the diastolic pressure on the use of sodium bromide. The sodium bromide produced more dyspnoea than did the sodium chloride and there was a decided vertigo and difficult enunciation of words.

#### DISCUSSION

For the past year I have been giving in my clinic a mixture of potash salts, as follows:

Potassium bromide grs. xx.

Potassium chloride grs. xl.

Potassium citrate grs. ix.

Simple syrup ..... 5

Sig. of this 3iv to be taken in water after food.

The above formula is used as the potassium bromide has shown itself one of the most efficient of the potash salts in reducing arterial hypertension, and in certain cases other than those quoted in this paper, where the chloride acted indifferently, this formula has been quite efficient. To balance the salt privation in the routine, the potassium chloride is included, in that the chlorine plays so large a part in stomach and kidney function. The citrate is one of the normal methods of potassium ingestion, and in the cases in which it was used and reported here it was the most potent salt in reducing the hypertension. The bicarbonate of potassium is now under experiment and its action will be reported later.

Bunge estimates the potash in the food of some classes as 50 to 100 grammes, *i.e.*, 850 to 1700 grains *per diem*, and deems the absence of any toxic action of the potash to be due to its rapid excretion in the urine.

In Bulgaria it has been pointed out by Metchnikoff that more than 1/10 of 1 per cent of the people reach 100 years of age, while in Great Britain less than 1/10000 of 1 per cent of people attain the century mark. This occurrence he ascribes to the large volume of milk taken in an acid or fermented condition and so influencing intestinal flora. Milk contains 90 grains of potash per quart. In addition the Bulgarians

CHART V

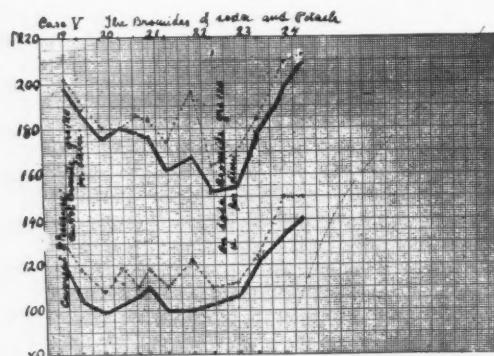
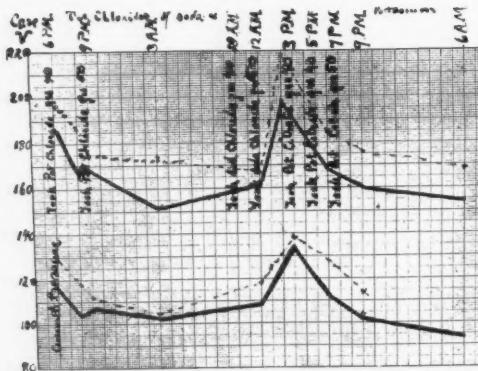


CHART VI



make use of sour wine, which has a heavy potash content as the tartarate. They also use vegetables and fruits, these also being rich in potash. Meat forms a small portion of their diet, and, while meat *per se* has a considerable potash content, its sparing use calls for a less amount of sodium chloride as a seasoning, thus lessening the tendency to excessive salt consumption.

One has forced on one the concept that the prevalence of arterial hypertension on this continent is in large part due to a potash poor diet, and an excessive use of salt (sodium chloride) as a condiment, and as a preservative of meat.

There has been a curious fear of the use of potash salts. This fear probably has been based on experiments done on heart muscle, with modified Ringer's solution, in which potash is in excess. The conditions *in vitro* do not obtain in the living animal, and this traditional dread is one of the myths consequent on the incompleteness of laboratory experiment. Cushing in his *Pharmacology and Therapeutics*, p. 521, quotes some work by Held, as follows: "In nephrectomized dogs, absorption of potash by the tissues proceeds so rapidly that it is only by intravenous injection or subcutaneous injections of very large quantities that the toxic threshold is reached. This does not occur if given by the

mouth. In mammals 1 gramme per kilogram has a toxic action, if given subcutaneously. No danger arises to man unless given intravenously."

#### SUMMARY

1. That in these cases the giving of potassium chloride, bromide and citrate is associated with a drop in blood pressure below the current one with a decrease in the symptoms of hypertension, and that the giving of sodium chloride and bromide is associated with a rise of blood pressure above the current one and an increase of the symptoms of hypertension.
2. That in Case 1 the potassium citrate was as efficient a salt in the reduction of blood pressure as the chloride, and in Cases 4 and 5 it was more efficient than the chloride.
3. That in Case 1 the soda apparently acted as the toxic agent in the nephritis.

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## THE TREATMENT OF FIBROIDS\*

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UNTIL further research reveals something more definite as to the causative factors underlying the development of fibro-myomata of the uterus, it is unlikely that efficient preventive measures will be devised. In the meantime, we are confronted with the problem of dealing with a condition where our treatment at its very best is directed toward protection of the patient against the injurious effects of these tumours. By no means are all fibroids of the uterus injurious, but a certain proportion of them sooner or later bring about a distinct disturbance

of function, while a small percentage will actually end fatally. The autopsy statistics of Hoffman show that 27.9 per cent of all women over 35 years of age have fibroids. It is thus very evident that this is a condition always to be considered, and frequently to be dealt with.

In the symptomless fibroids we are not particularly interested, except to say that we do not believe that radical measures should be adopted just because a fibroid is accidentally discovered. There is an exception to this statement, to be found in the nervous type of patient, who has come to learn that she possesses a fibroid, and whose intelligence is such that she will be un-

\*Read at the Canadian Medical Association Meeting, Toronto, June 17th, 1927.

happy in knowing that she has a tumour, even though no symptoms were ever present.

Fibroids requiring treatment may be roughly divided into two classes, (1) Those which may be treated by irradiation, either by radium or roentgen ray; (2) Those best treated surgically.

In reading the literature on the treatment of fibroids, one cannot help being struck by the differing opinions expressed as to the cases suitable for radiation as contrasted with operation. The enthusiastic radiologist points out the dangers of surgery, and would have one believe that radiation-therapy is the only safe and satisfactory method. Other writers are much more in favour of surgery, leaving to radiation only the cases in which there is some grave contra-indication to surgery. I am inclined to believe that the correct position is somewhere between these extremes. It is as ridiculous for anyone to insist that radiation therapy is always safe and never followed by morbidity, and sometimes mortality, as for the surgeon to contend that operation is always free from danger. There is a certain mortality, which is unavoidable in any major surgical procedure, and although it may be kept at a minimum, nevertheless it is always present. Exactly the same holds for radiation-therapy, as shown by the following case history:—

Miss A. Treatment for fibroid began in January, 1923, and was given, according to standard technique, every three weeks for four months; when the patient began to feel weak and the treatment was given only every five weeks. The patient's condition then improved, and she appeared to be doing well until three months later, when she developed a burn on the abdomen and right inguinal region. This large indurated area gradually broke down and formed a large sloughing ulcer, very painful, and difficult to heal. On three occasions she developed erysipelas, from which she made good recoveries. In 1926, while the burn was still not completely healed, she again developed erysipelas from which she did not recover. Her total stay in hospital was 838 days.

Our first duty in determining treatment must be to decide whether our patient shall be treated surgically or by radiation. This decision, aside from the actual type or condition of the fibroid, is necessarily dependent upon other factors, principally other pelvic conditions, such as lacerations, erosions, adnexal disease, or the possibility of early malignancy, as well as the general condition of the patient. As a rule, I think that no patient under 40 should be subjected to irradiation, unless very grave complications render surgery unsafe. In a study of 250 cases treated surgically, Ford reports 11 cases of unsuspected adeno-myomata, 4 cases of carcinoma of the ovary, and 1 of carcinoma of the uterus. There were 31 degenerating myomata, while 40 per cent of the cases showed

some chronic pelvic inflammation. Studies of another series of patients, in whom irradiation had been done, revealed the fact that 18 per cent required further radiation, while 13.7 per cent were later treated surgically, as compared with 4 per cent in the surgical group which required further treatment.

The presence of infection in the cervix or adnexa is a most important factor in deciding against radiation and in favour of surgery, and in deciding the type of operation. The choice of operation is important, once surgical treatment has been decided upon, and, aside from the character of the local lesion, must depend upon the age of the patient and her desires regarding motherhood.

In order to exclude carcinoma of the fundus in all cases of uterine haemorrhage with tumour formation, writers of the widest experience advise a diagnostic curettage before *any* treatment is undertaken. Unless there are distinct contraindications to operation, it is generally held that surgical treatment is preferable in patients who may still expect to bear children.

We, at the McGregor-Mowbray Clinic, have had the advantage of having radium, x-ray, and surgery equally at our disposal, and, therefore, have not been tempted to operate on patients, rather than irradiate them. We feel that both types of treatment have a distinct field, but that one should not indiscriminately treat all fibroids by either method to the exclusion of the other. Radiation has not the wide scope that some of our radiologist friends are apt to believe, neither should this valuable means of treatment be relegated to the discard by surgery. In patients of 40 years or over, whose nervous systems are stable, I believe we should radiate cases in which haemorrhage is the prominent feature, and in which tumours range in size from small myomatous nodules up to freely moveable ones as large as a three months' pregnant uterus providing these tumours are not sub-mucous, pedunculated, degenerating, or rapidly growing, and that the uterus is otherwise normal. Radiation is usually contraindicated wherever there is any suspicion of pelvic infection or adnexal disease. This is the case in 40 per cent of fibroids. Patients of the operative class, where operation is dangerous on account of other serious constitutional complications, are also better treated by radiation, because some improvement may be expected, even if the ideal cannot be attained.

The roentgen ray is probably dependent for a

great deal of its curative power upon its effect on the ovarian function. Some contend that radium also acts in the same way, but to me it seems that radium inside a uterus is less likely to produce a profound effect on the ovaries than is roentgen radiation from which they cannot be protected. Roentgen radiation is inadvisable in patients of nervous temperament, as a premature menopause may be very distressing.

Whether x-ray or radium shall be the method of choice depends largely upon circumstances. X-ray is certainly easier to apply and may cause the patient less inconvenience, but a more prompt cessation of bleeding can usually be obtained by the use of radium. Not only is cessation of bleeding apt to be more prompt in properly selected cases, but the effects on neighbouring organs is much less. The dosage should be the minimum amount which will bring about the desired result. With radium inserted in a capsule, so heavily screened as to eliminate practically all but Gamma rays, placed in the uterine cavity well up into the fundus, and left in position long enough to deliver 600 to 900 mgm hours, this form of treatment is probably nearest the ideal, and quite sufficient in the majority of cases. The roentgen ray may produce the same effects, but in doing so one cannot prevent the neighbouring organs from being influenced. This radiation of other organs is not always without danger. It is a mistake to believe that radiation is a harmless and conservative means of treatment. Masson says "The fact should not be lost sight of that a surgical operation is often a more conservative form of treatment than the administration of even a small dose of radium or roentgen rays." W. J. Mayo says, "Radium must justly be considered in selected cases as a competitor of hysterectomy, but it has no comparative standing in cases suitable for myomectomy."

The cases suitable for surgery are broadly speaking:—

- (1) All patients under 40 years of age, and those over 40 unsuited for radiation.
- (2) All submucous fibroids or other pedunculated tumours.
- (3) All fibroids in which adnexal disease or inflammation is present.
- (4) Uteri in which any pathological lesion, other than fibroids, is present. This must include lacerations, erosions and degenerations of the cervix, together with carcinoma of the body of the uterus.
- (5) All tumours causing pain or pressure, or mult-nodular tumours filling the pelvis or lower abdomen, especially those interfering with urinary function.
- (6) Where there is reasonable doubt as to the nature of the tumour, or where some other serious complication is present.

Having decided upon surgical treatment, we are again confronted with a choice in procedure, and one must choose between myomectomy, subtotal hysterectomy, and total hysterectomy.

#### MYOMECTION

Myomectomy is an operation which gives excellent results, and in the hands of good surgeons the mortality is about the same as in hysterectomy. It has limitations, but I feel that it has a much greater field of usefulness than it is credited with. It should always be considered in patients under 40 years, and I feel should be the rule in all cases under 30. Keith Murray reports that 85 to 90 per cent of patients menstruate normally, and that 28 to 30 per cent conceive after myomectomy. A single subserous or intramural growth is the ideal type for this operation, but multiple growths may safely be removed. Myomectomy may frequently be done on a pregnant uterus without interrupting pregnancy. The abdominal route is the most satisfactory, except in submucous polypi. Degeneration of a fibroid, whether it be red, gray, or calcareous, is no contraindication to myomectomy provided careful technique is observed.

Myomectomy is not advisable in the presence of severe anaemia, nor in women past the menopause, unless operation is very simple. It is contraindicated in the presence of tubal inflammation, and in any case of multiple fibroids so situated that the operation may be too prolonged and attended with extreme shock. Acute infection in a fibroid may be a contraindication, especially if the fibroids are multiple. A chronic infection, in which the patient has had time to develop immunity, is not a barrier to myomectomy. The operation is more tedious, more difficult, and perhaps occasionally more serious than that of hysterectomy.

The best time to operate is immediately after a period. Make the incision right into the fibroid and one can much more readily find the line of cleavage. This is particularly important in large fibroids, especially of the soft type. Whenever one has difficulty in enucleation, it is wise to extend the incision deeper into the fibroid. Where a whole nest of small fibroids are close together sometimes the surrounding tissue is so firm that one mistakes it for the fibroid itself. In the case of multiple fibroids, it may not always be possible to make all the incisions on the front of the uterus, as recommended by Alexander, or to tunnel the uterus, as is done by Bonney. In every case,

one should aim at reducing the number of incisions into the uterus to a minimum. One should never hesitate about opening into the uterine cavity if it will facilitate enucleation, and it should never be omitted if there is any suspicion of a polypoid endometrium or a tiny submucous fibroid. In fact, in all cases where bleeding has been the most prominent symptom, I feel it should be done routinely. Frequently, during enucleation, one may see strands of tissue, which may contain vessels, and should be clamped before division. Every cavity should be completely obliterated with catgut, after having ligated all bleeders. I think this is best done in layers by continuous suture. The serous coat should be carefully and accurately sutured, drawing each stitch just tightly enough to slightly blanch the cut edges. Excess tissue is better not cut away, providing haemostasis is perfect.

The main risk of myomectomy is intestinal obstruction, due to oozing of blood from the incisions in the uterus. Therefore, the absolute control of haemorrhage is imperative. As far as feasible, make incisions on the anterior surface of the uterus, and where this is not possible be sure to cover them with peritoneum. After the operation is completed, the uterus is frequently very misshapen, and looks as if it could never function normally again. It is well to remember that the uterus heals satisfactorily, and shows practically no weakness in future pregnancies. Keith Murray says, "The uterus, apparently mutilated by the enucleation of multiple fibroids, has a power of recuperation and involution incredible to those who have not tested it." The following case illustrates this point:—

Miss H., operated upon on December 2nd, 1922, for multiple fibroids. At the patient's request myomectomy was done, and five tumours, varying from 2 inches to 4 inches in diameter, were enucleated through three incisions into the uterus. This left the organ so distorted and misshapen as to bear no resemblance to a uterus. On February 26th, 1926, she was operated upon for an acute intestinal obstruction, due to a loop of jejunum having become adherent to the abdominal scar of the former operation. Examination of her uterus at this time, showed it to be normal in shape, size, and position, and to all appearances capable of perfect function.

The sentimental value of the conserved uterus must never be lost sight of. Recently a very neurotic patient with multiple fibroids, in whom I had asked to be permitted to perform a hysterectomy should it be that I found myomectomy too prolonged, made the statement that she had been told that after hysterectomy the marital relations were altered, and she was, therefore, anxious that hysterectomy should be done only

as a last resort. In this case even though it was necessary to remove twenty-eight myomata, I felt that the added risk was quite justifiable.

Giles says, "There is a recurrence of symptoms in 10 per cent of the patients." This, Bonney says, is always due to having overlooked some small tumours. He believes that the seeds of all fibroids are formed before the age of thirty-five. Undoubtedly, the more myomectomies one performs, the better one does them, and with less risk of overlooking small tumours. There may be a trifle more risk in doing myomectomy than hysterectomy, but there is very little difference in good hands. Masson reports 259 cases of myomectomy with 2 deaths, or 0.77 per cent, while during the same period there were 1,643 hysterectomies for fibro-myomata with 31 deaths, or 1.88 per cent. The mortality should be limited to accidental causes, of which pulmonary embolism represents about 50 per cent.

There is a reasonable chance of pregnancy following myomectomy. Schmidt reports 40 per cent of pregnancies in patients under 35, Giles reports 26 per cent, while Noble says 10 per cent. In any case there is a sufficient number to warrant a wider application of this very satisfactory operation.

#### Hysterectomy

Hysterectomy must be the operation of choice in all cases—

- (1) Where myomectomy is not considered wise.
- (2) In all patients over forty years of age, who are not suitable for irradiation.
- (3) Where tumours are rapidly growing or degenerating.
- (4) Where pain is present, or where pressure causes urinary disturbance or constipation.
- (5) Where there is metrorrhagia, or a foul uterine discharge.
- (6) Where signs of malignancy in the body are present. Should a definite carcinoma of the cervix be also present, the case is much better treated with radium.
- (7) In all cases of marked anaemia, where further loss of blood may be serious. One should usually do transfusion as a preliminary. In these urgent cases, hysterectomy is much better than radiation, which may not bring about a cessation of bleeding for several weeks.
- (8) Finally, all cases with concomitant adnexal disease or inflammation, as well as all those with lacerations, erosions, and degeneration of the cervix, conditions which will probably give rise to further trouble should be cured by hysterectomy.

I feel that one should conserve the ovaries in every case, if the patient has not reached the menopause. If the presence of pelvic infection necessitates their removal, normal parts of them may be transplanted into the abdominal wall. I have seldom seen marked nervousness suggestive of an artificial menopause follow hysterectomy, with preservation of the ovaries.

I feel that total hysterectomy, rather than subtotal, should be done on all women who have borne children, and especially if there is any disease whatever in the cervix. I have repeatedly seen patients, whose cervix was left behind after subtotal hysterectomy, who were most unhappy because of a persistent leucorrhœa. In the last year I have seen two cases where malignancy developed in the cervix left behind at operation some years previously. For these reasons, I am convinced that one should do a subtotal hysterectomy only in women who have not borne

children, and whose cervixes are absolutely normal.

In deciding which of the above mentioned methods of treatment we shall employ, we must be guided not only by the fibroid and its type, location and condition, but we should also remember that other associated pathological conditions are frequently present. Our aim should be to employ the most conservative treatment which will eradicate the pathological condition, and bear in mind the preservation of the function of the uterus, when feasible, and of the ovaries always.

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## PROPHYLACTIC EXTERNAL CEPHALIC VERSION IN BREECH PRESENTATION\*

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THE purpose of this paper is to add to the increasing evidence of the value of routine external cephalic version in uncomplicated breech-presentations. This applies not alone to primiparae, in whom the foetal death rate due to breech extraction is unquestionably high; but also to multiparae, in whom the foetal death-rate, although not so high as in primiparae, does not approach, in the hands of the accoucheur of average skill, the more favourable results obtained in vertex deliveries.

Although a number of the modern text-books on obstetrics still stress asphyxia as the cause of foetal death, due to pressure on the cord from delay in delivery of the after-coming head, more recent authors have established the fact that the great majority of foetal deaths in breech-deliveries are due to trauma. The comparatively fast delivery of the after-coming head, through the incompletely dilated os, the bony pelvis, and undilated pelvic floor, with the sudden compression of the antero-posterior diameters of the skull, suggests a traumatic cause. Holland<sup>1</sup> in his interesting article on cranial stress in the foetus during labour says, "Tearing of the tentorium is found in 88 per cent of dead

foetuses in cases of primary uncomplicated breech deliveries, i.e., as the result of normal breech deliveries." Pierson<sup>2</sup> has shown in 36 cases that trauma was the cause of death in 56 per cent; asphyxia alone, the probable cause in 5 per cent; and trauma with asphyxia, the cause in 39 per cent. Browne<sup>3</sup> summing up the causative factors of death in 153 newborn says: "If we take 3 per cent as the normal frequency of breech deliveries, it is found that the latter is ten times as likely to give rise to cerebral haemorrhages as delivery by the vertex."

Since a more exhaustive routine post mortem examination of the foetus has been instituted, in some of the recent series (Pierson), fracture and luxation of the cervical spine have frequently been encountered. Fracture of the long bones is also occasionally met with. Tears in the tentorium have been demonstrated many months after delivery. How much these tears with the attendant haemorrhage may affect the early days of the child that has stood the ordeal should not be overlooked.

The standard text-books of to-day give the foetal mortality in breech-delivery as varying from 3 to 15 per cent. If we consider the more recent articles, even this percentage is too low. The most favourable results obtained are from

\* Read before the Winnipeg Medical Society, December 16, 1927.

the practice of men specially skilled in the art of breech-deliveries. Gibbard<sup>4</sup> has shown, from a compilation of figures from six maternity centres in England, a foetal death rate of 26 per cent, with a neonatal mortality of 6 per cent out of 136 uncomplicated breech deliveries. The New York Lying-in Hospital's report for 1924 showed a death rate of 16.4 per cent after conducting the congenital anomalies and macerated foetuses. Pierson has shown a foetal mortality of 12 per cent in a series of 142.

In the Winnipeg General Hospital, from January, 1923, up to and including September of last year, there were 104 primary breech-deliveries in both private and public services, 6 of which were complicated. In the remaining 98 cases there were 7 premature, 3 congenitally malformed, and 2 macerated foetuses, leaving a total of 86 viable foetuses in primary breech-presentations at term. The results from the 86 cases are as follows: multiparae 56; primiparae 30; stillborn 17; fracture of humerus 1; fracture of the femur 2; complete lacerations of the perineum 3; and maternal deaths 2. The total foetal death rate was 19.8 per cent. The foetal death rate in multiparae was 23.2 per cent and in primiparae 13.3 per cent. The last two percentages are the reverse of what one would expect.

#### SUMMARY OF THESE BREECH DELIVERIES

Total cases .....	104
Stillborn .....	(32.7 per cent)
Complicated deliveries .....	6
Primary breech deliveries .....	98
Primary, uncomplicated breeches .....	98
Exclude: Premature .....	7
Congenital malformations .....	3
Macerated .....	2
	—
	12
Primary breech; viable fetus, at term .....	86
Multiparae .....	56
Primiparae .....	30
Stillborn .....	17
Fracture of humerus .....	1
Fracture of femur .....	2
Complete lacerations .....	3
Maternal deaths .....	2
<i>Fatal mortality.</i>	
Total .....	19.8 per cent
Multiparae .....	23.2 per cent
Primiparae .....	13.3 per cent

If we accept the foetal mortality in vertex deliveries as 2 to 3 per cent, the advantage of

substituting a cephalic for a pelvic presentation is at once apparent.

The foetal mortality does not, unfortunately, tell the whole story. The mother is subjected to a greater risk of infection, from the early rupture of the membranes and from the more frequent examinations and intravaginal manipulations necessary in delivery of the foetus. Lacerations are also more extensive, and severe tears not uncommon, especially in primiparae.

Most of the modern authors make a passing reference to the advisability of doing a version in breech-presentation, if possible, especially in primiparae. The multipara is passed by in disdain. I would make a plea that we give more time and attention to the multipara than heretofore. Our statistics show an abnormally high foetal death-rate in this class of case and indicate a possible lack of the same care given to primiparae. In my opinion, external cephalic version in properly selected, uncomplicated, cases of breech presentation cannot be over emphasized.

In the last three years I have attempted to establish the benefits to be derived from external version. As a result all breech-cases that have come under my supervision, both in the prenatal clinic of the Winnipeg General Hospital, and privately, I have attempted to turn, unless some contra-indication existed. These patients were examined monthly up to the seventh month, and every two weeks thereafter, unless existing conditions demanded closer supervision. The patient in whom version was found necessary was re-examined the following week, and if necessary the version was repeated.

The great majority of these cases were delivered in the public ward of the Winnipeg General Hospital by the interne, and as he is, as a rule, making his bow to the art of obstetrical delivery, the results here obtained are all the more valuable, and emphasize the benefit to be derived from external version by the physician who has a limited experience in breech delivery. The results stand out in marked contrast to those obtained from breech-extraction by more experienced men in the same institution.

The total number of breech-cases encountered was 62. Of this number two attempts at version were unsuccessful. The first one was an unmarried primipara at term; the breech was well down in the pelvis and could not be dislodged

with moderate pressure. She refused anaesthesia and no further attempts were made. The second was a young multipara, also at term; version was unsuccessful both without and with ether. X-rays showed both the foetal legs to be extended. There were three cases in which version was not tried. The first case was twins. At the seventh month both foetuses presented by the breech; during the eighth month both underwent spontaneous version, and at term both were presenting by the vertex. During the birth of the first child, the second turned spontaneously and was delivered as a breech. The second case was also similar—twins which presented by the vertex during pregnancy, but during labour the second foetus turned and was delivered as a breech. The third untried case was the only premature delivery in this series. Throughout pregnancy the foetus was presenting by the vertex. Between the time of the last examination and the onset of labour the foetus turned spontaneously, and when seen in labour the breech was presenting. As the patient was well on in the second stage, when first seen in labour, and as the pregnancy had only advanced to the eighth month no attempt at version was made.

In the remaining 57 cases, version was successfully performed and all were delivered by the vertex, save one which was delivered by Cæsarean section. Of this number, 23 were primiparae and 34 were multiparae. An analysis of the gestation month in which version was performed showed; one in the sixth month; 21 in the seventh month; 24 in the eighth month; and 11 in the ninth month. One version was all that was necessary in 48 cases, 2 versions in 6 cases, and 3 in 3 cases: 54 foetuses were turned in flexion, and 3 were turned in extension, or backwards. The cord was found to be normally situated in 45 cases, and to be once around the neck of the foetus in 12. In the entire series there was one foetal death. In this case the mother had been in hospital under treatment for toxæmia for two weeks. There was albumen in the urine, and the systolic blood pressure had reached 170. Labour was rapid; there was a premature separation of the placenta, and the child was born in a state of white asphyxia.

Many objections have been raised against the performance of routine external cephalic version.

In this series I have encountered none of the difficulties suggested.

It has been said that partial separation of the placenta with haemorrhage may occur. Ryder<sup>5</sup> and Gibberd<sup>4</sup> each mention one case which went to a favourable termination. The possibility must ever be borne in mind. As Gibberd has pointed out, this is most likely to happen under anaesthesia, when the manipulations of the operator are not held in check by the subjective feelings of the patient. On the other hand, force has no place in the performance of version. In the present series there was no haemorrhage.

Premature labour has been cited as a sequel to version. As it is sometimes difficult to establish the cause of prematurity, this objection is difficult to prove. In the present series, the only premature case was that of a primipara on whom version had never been performed.

Anæsthesia is said to be frequently necessary. It was used twice in this series. In the first case, that of a young multipara, at term, the breech was well down in the pelvis, both foetal legs were extended, and version was not successful, even under ether. The second case was that of a nervous primipara who resented the slightest touch. Under ether the foetus was turned with extreme ease.

The danger of winding the cord around the neck of the foetus has been advanced. The results here obtained are within normal limits. It was normally placed in 45 cases, and once around the neck of the foetus in 12.

The statement has been made that even after version has been performed the foetus may revert to the previous presentation. This is true, but it is also an argument for closer pre-natal supervision with subsequent version. In this series one version was successful in 48 cases, in 6 cases external version had to be performed twice; while in 3 cases 3 attempts were necessary. No case in which version had once been performed was delivered as a breech.

Prolapse of the cord with its subsequent presentation is occasionally mentioned and brought forward as an argument against version. There is no reason why this condition should exist after external version, any more than after spontaneous version. Its occurrence has been reported, and is possibly more common when the cord is excessively long.

The number of cases in this series that

would have undergone spontaneous version, if left to nature, unfortunately cannot be estimated. The occurrence of spontaneous version in the seventh month of pregnancy is common; in the eighth month, less common; and in the ninth month, relatively infrequent. Spontaneous version is more common in multiparæ. If one allows the breech to remain in the hope that spontaneous version may occur the most favourable time for external version may be lost. It appears from the present figures that the best time to perform external version is during the seventh and eighth month; 79 per cent of the versions performed were in these two months.

#### EXTERNAL VERSION

TOTAL BREECH CASES ENCOUNTERED, 62

*Version.*

Failed .....	2
Untried .....	3
Successful .....	57

*Successful Versions* .....

<i>Parity</i>	
Primiparæ .....	23
Multiparæ .....	34

*Month*

Sixth .....	1
Seventh .....	21
Eighth .....	24
Ninth .....	11

*Attempts*

One .....	48
Two .....	6
Three .....	3

*Turned in*

Flexion .....	54
Extension .....	3

*Cord*

Normal .....	45
Once around the neck .....	12

*Cæsarean Section* .....

<i>Fœtal Mortality</i> .....	1
(Premature separation of placenta; mother in hospital under treatment; toxic; systolic blood pressure, 170).	

#### TECHNIQUE

The substitution of a cephalic for a breech presentation by external manipulation, is, as a rule, not difficult. The bladder and rectum should be empty. The patient's shoulders

should be well elevated and the knees slightly flexed. The position of the fœtus should be accurately diagnosed, and the pressure used in turning so directed as not to interfere with the normal attitude of flexion. The fœtus is best turned forwards, which retains the normal relationship of the fœtal parts. Occasionally, pressure has to be used as if to turn the fœtus backwards, on account of the greater accessibility of a fœtal part; if pressure is also exerted on the opposite fœtal pole extension will be prevented. Three of this series were turned backwards.

The more one can reduce the long axis of the fœtal ovoid, the easier will be its passage through the short transverse diameter of the uterus. This is best obtained by pressure on both poles and increasing spinal flexion.

The first step is to disengage the presenting part and direct it into the opposite iliac fossa to that in which the head will descend. This is the most difficult part in primiparæ at term. The disengagement is greatly assisted by the use of the Trendelenberg position. Once the breech is disengaged and held there pressure is exerted on the occiput and flexion increased until the fœtus is in the transverse axis of the uterus. At this point the mother occasionally experiences slight discomfort. The head is now guided into the pelvis and pressure exerted upon it to accommodate it to the new surroundings. As previously mentioned, version is more difficult when the feet are extended. Pads may be used to retain the presentation but as these patients were up and around no pads were used.

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It is interesting, apropos of the general fall in the birth-rate, to note what Professor Karl Pearson has to say about some of its effects in his "Life of Francis Galton." Remarking how greatly the chances of perpetuating ability are reduced when men leave but one or two children to preserve their name, he says: "Let the reader remember that with our modern views as to

parental responsibility neither Charles Darwin nor Francis Galton would have been born. Herein lies, we fear, too certainly the key to that dearth of exceptional ability which marks our age. "Francis Galton himself recognized fully that the modern principle of small families, applied to all stocks, spelt disaster for the nation.—*The Weekly Times*, Dec. 8, 1927.

## OBSERVATIONS ON SOME OBSTETRICAL DIFFICULTIES\*

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THE difficulties in obstetrical practice are so many and varied that I purpose in this paper to deal with only a few of them.

## PERSISTENT OCCIPITO-POSTERIOR POSITIONS

In such a position the occipito-frontal diameter, measuring three quarters of an inch more than the suboccipito-bregmatic, has to engage, descend through the pelvis, and distend the vagina; a descent in which each movement is more difficult and hazardous than in the anterior position. However, in a multipara with normal pelvic measurements, and a previous history of normal deliveries, the birth is often effected with no great difficulty, if left to follow *vias naturales*, either by rotation anteriorly, or with face to pubes. Analyses have shown that in 60 per cent of all posterior positions the head is small, a fact which may account for the occiput remaining posterior.

If the patient makes no progress the best method to employ is that of manual rotation, and the application of axis-traction forceps. It is best to use the right hand to rotate the head, which is, if possible, pushed up slightly before rotation is attempted, and the free left hand used to turn the shoulders by external abdominal manipulation. Failing this, the hand in the vagina should be passed above the head, and the trunk of the child internally rotated. If the trunk is not rotated as well, it is very difficult to prevent the head from slipping back to its original position during the application of the forceps.

There is another method which I shall mention, that is the use of Kielland's forceps. This is a method very much employed in Vienna and Prague, but hardly ever by English obstetricians. Its use in the aforementioned condition however is often of great assistance. In Vienna (where Kielland's forceps is em-

ployed in all forceps-deliveries) the anterior blade is applied first, and in the antero-posterior diameter of the pelvis, with the concavity upwards. The left hand is introduced into the vagina, the child's head palpated, and the presentation exactly determined. The anterior blade is now gently pushed up between the guiding left hand and the child's head until the blade has completely disappeared into the uterine cavity and the lower part of the sliding lock is just visible. In so doing it is a common thing, if the patient be not too stout, to actually see the ascent of the blade between the child and the uterus through the anterior abdominal wall. The blade is now turned so that its concavity points downwards and gently withdrawn until it becomes smoothly and firmly applied to the child's head. The posterior blade is then introduced in the antero-posterior diameter behind, with its concavity upwards, and the sliding lock is now easily adjusted. A point of note is, that the forceps is always applied in the biparietal diameter of the child's head, regardless of the presentation. One of the difficulties in applying these forceps is to determine which is the anterior blade. Allow the forceps to rest on the palm of the left hand with the buttons (marks on the handles) pointing upwards. Now turn the buttons towards the presenting part, as in a right occipito-posterior presentation. The buttons point downwards and to the right. Unlock the blades, remove the anterior one, and proceed as I have just described. During the application of the forceps the patient must be under deep narcosis, and rotation only attempted during a lull in the labour pains. If the rotation is at all difficult, the locked forceps should be pushed up, and rotation will become easier. The direction of the pull is downwards. The advantages of Kielland's forceps in this type of presentation are, that (1) Only one application of forceps is required. (2) It combines

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rotation with traction. (3) It has a sliding lock (shoe-horn type). (4) It is lighter and more slender than the ordinary forceps.

The disadvantages are: (1) A possible rupture of the uterus during the introduction of the anterior blade. (2) Severe vaginal and cervical tears during the rotation of the head. (3) Being a straight forceps, the line of traction is not in the axis of the genital canal.

Kielland's forceps undoubtedly has a field of usefulness in the treatment of persistent occipito-posterior positions, as it can be applied to a floating head, and as an instrument of rotation it is unsurpassed. This method of treating posterior positions, however, is not the one commonly adopted in England. With few exceptions, the majority still prefer manual rotation and the application of axis-traction forceps.

Mr. Bourne was the only man at Queen Charlotte's Hospital, London, to use this forceps. The students were not taught its use, as it was considered dangerous in unskilled hands. The teaching in regard to and the treatment of posterior positions are practically the same in England and Paris as in Toronto. In Vienna and Prague Kielland's forceps is used for every type of forceps-delivery. I may say that Kielland's forceps was occasionally employed for an arrested transverse position of the head at the brim, that is where the sagittal suture lies transversely. In such a case, the application of this forceps is very useful, in that it can be applied once, the head drawn through the brim, rotated, and the forceps removed when the head is crowned. In applying the anterior blade in such cases, the buttons on the handle are turned towards the small fontanelle, and then the anterior blade is removed and introduced as before mentioned.

There are two difficulties in breech presentations of which I desire to speak: (1) The breech presentation with extended legs. (2) Delivery of the aftercoming head.

#### THE BREECH PRESENTATION WITH EXTENDED LEGS

Extension of the legs is usually present before rupture of the membranes, and hence its early recognition is to be sought for, so that a line of treatment may be decided upon

before the breech is driven down into the pelvis. A useful dictum is, "Determine early in the case of a vertex presentation if it is a posterior position; in the case of a breech, if the legs are extended."

The diagnosis can often be effected by feeling the legs along the child's body and in close proximity to the head. If these cannot be felt, anything that prevents the flexion of the breech on itself should make one suspicious of extended legs being present. These splint the trunk of the child and prevent lateral flexion occurring. If the diagnosis has been made early in labour, and the child is at term, so soon as the cervix becomes dilated sufficiently to allow the introduction of the hand, the breech should be pushed up out of the pelvis, and a leg, preferably the anterior, brought down. This will allow lateral flexion to occur, and at the same time cause extension of the spine, thereby bringing the foot of the other leg below the level of the head. By further traction the buttocks are brought forward. If the cervix is fully or nearly dilated, then both legs if possible should be brought down. In a primipara it is better in most cases to be content with one leg, as the cervix becomes fully dilated more slowly, and the vaginal passage more slowly stretched. As has been shown by Mr. Eardley Holland, of England, and by Dr. Potter in this country, speed is not essential in the delivery of any breech. A very excellent way of bringing down a leg is to press into the bend of the knee with the fingers, and at the same time press down with the other hand on the abdomen. This produces flexion of the knee-joint and makes it very easy to grasp an ankle and draw down the foot. If the breech is impacted the legs are practically always extended. In such a case a preliminary hypodermic injection of morphine is advisable, and the patient is fully anaesthetized. If possible, the breech should be pushed up out of the pelvis, and the leg pulled down as described before. Where the child's body is large a unilateral episiotomy is very useful. If this is not sufficient, bilateral episiotomy should be done, thereby dropping the whole pelvic floor. This makes delivery much easier. If the impaction cannot be undone, traction should be applied by the fingers in the anterior groin and later transferred to the posterior

groin, when the anterior buttock has been brought down under the symphysis. If this fails, as it often does, a blunt hook must then be resorted to. This is attended with great danger to the child such as, fracture of the hip, dislocation of the hip, and bruising of the soft parts. If the child be dead, one should not hesitate to use this instrument. The fillet is rarely if ever used now.

#### DELIVERY OF THE AFTER-COMING HEAD

Mr. Eardley Holland, of the London Hospital, has shown by autopsies performed on 16 dead fetuses delivered by the breech that 14 showed severe intracranial injuries. All of these were associated with a rapid delivery of the after-coming head. Whilst resident medical officer at Queen Charlotte's Hospital I had the opportunity of performing five autopsies on difficult breech deliveries, and in all of these tears of the tentorium cerebelli were present. During any breech delivery the forces acting upon the child's head are unduly excessive and rapid and as a result moulding has not time to occur. The cranium is so constructed that moulding can occur in the vault, but very little if any in the base. This moulding takes place slowly and with no harm if the head is well flexed in a vertex presentation. In a breech the situation is entirely different. Here rapid delivery is often attempted, to prevent asphyxia ensuing from compression of the cord and premature inspiratory efforts. In attempting rapid delivery excessive and abnormal forces are liable to be applied to the cranium, with the result that

intracranial damage frequently occurs. The commonest noted injury is a torn tentorium. This I think is due to four reasons: (1) The more fragile nature of the tentorium. (2) Its relatively large size. (3) The strength and shortness of the vertical fibres of the falx cerebelli and cerebri. (4) The upward pull of the falx cerebri. There were no tears of the falx cerebri and the falx cerebelli. The tears are usually at the free edge of the tentorium, and at the point where the falx cerebri joins the tentorium. Here, the upper pull of the falx tears the free border of the tentorium and allows escape of blood from Galen's vein or its tributaries. This is easily seen anatomically as Galen's vein joins the straight sinus at the junction of the falx cerebri with the tentorium cerebelli.

As the majority of, if not all, stillborn breech-delivered children show tentorial tears or tears with haemorrhage, it seems only reasonable to regard rapid delivery of the after-coming head as not desirable. A child can tolerate ten minutes of anærosis without dying, and it is very doubtful whether the small premature inspiratory efforts will permit a sufficient amount of amniotic liquor or sanguineous exudate to be inhaled to jeopardize its life. The mouth is usually pressed tightly to the maternal passages, and the lungs are collapsed, and, although inspirations may be feebly attempted, nothing or very little can be inhaled. At the same time, moulding is gradually taking place and there will be less likelihood of intracranial damage ensuing.

#### COMMENTS ON EPHEDRINE AND ITS USES\*

BY HARRIS MCPHEDRAN, M.B. (TOR.)

*Toronto*

THE object of this brief communication to the Fellows of the Academy is to draw attention to the drug ephedrine, as it has a usefulness which is not yet fully appreciated.

Ephedrine is the alkaloidal active principle of the Chinese plant Ma Huang, which has been known in Chinese medicine for some 5,100

years. The plant is a low, practically leafless, shrub, about 60 to 90 cm. high. It is sold freely in the neighbourhood of Pekin, and has been used in China as a diaphoretic, circulatory stimulant, antipyretic, sedative in cough, etc. The active principle, ephedrine, was first isolated in an impure form from the stems of Ma Huang by G. Yamanashi of Japan in 1885. His studies were continued by Nagai<sup>1</sup> and Hort

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in Japan, and Merck<sup>2</sup> in Germany, and more recently by Chen<sup>3</sup> in the United States. The chemical structure has been worked out, and synthesis of the drug accomplished.

From a clinical standpoint some features of its pharmacological action are noteworthy. Its outstanding effects are due to stimulation of the sympathetic nervous system, and are qualitatively identical with those of epinephrine. It is a true "sympatho-mimetic amine." Also in animals it stimulates the central nervous system and depresses the heart, in toxic doses.

The chief manifestations of the physiological action of the drug in animals are seen:

1. In increased rate of the heart and rise in blood pressure.
2. Relaxation of smooth muscle
  - (a) Of the intestine.
  - (b) In the bronchioles.
  - (3) Of the eye.
3. Vaso-contraction of the blood vessels of the nasal mucous membrane.

From the clinical standpoint, certain of these proved physiological effects in animals have been duplicated in man. It produces mydriasis in man. Its effect on the human eye was studied by Miura<sup>4</sup> in 1887. He found that a 10 per cent solution of ephedrine hydrochloride caused mydriasis in from 40 to 60 minutes, lasting 5 to 20 hours, and reported that there was no cycloplegia, no secondary inflammation, no change in intra-ocular tension, and no untoward effects after prolonged use. Chen<sup>5</sup> got a similar result with a 4 per cent solution. Merck,<sup>6</sup> in 1894, used it in combination with homatropin (calling the mixture "mydrin"), for examination of the fundus.

On the nasal mucous membrane it produces blanching. In a 5 per cent solution it is said to have all the advantages of epinephrin with none of its disadvantages. Fetterolf and Sponsler<sup>7</sup> report that shrinkage of the turbinates begins almost immediately, is complete within five minutes, and persists for nearly three hours. There is no sign of local irritation, nor subsequent dilatation of the blood vessels in the mucous membrane.

Blood-pressure is raised by this drug, and the pulse is usually slowed. Rudolf and Graham<sup>8</sup> report that in a series of seventeen patients more than 80 per cent showed a rise in

the systolic pressure of more than 20 mm. of mercury, but the diastolic pressure was not affected to any great extent. The action of the drug usually appeared within half an hour. The maximum effect was manifest in three-quarters of an hour.

The writer has been principally interested in this drug through its use in bronchial asthma. Physiologically, it acts by relaxing the bronchial muscle in the animal, and a similar result is obtained in man. In doses of three-eighths to three-quarters of a grain by mouth, usually in half to three-quarters of an hour some relief of the bronchial spasm is obtained, and often the patient is carried through the night with only a single dose taken just at the time of retiring.

#### TYPICAL CASES

Mrs. M., aet. 28.—Has had chronic bronchitis with asthma for years. A course of mixed vaccine in 1921 helped her very materially, but she still had frequent attacks of asthma, necessitating one or two doses of adrenalin at night. Since being advised to use ephedrine she reports that taking three-quarters of a grain by mouth relieves the attack in one-half to three-quarters of an hour, and she has no further trouble that night.

Mr. A. T., aet. 61.—Had broncho-pneumonia in January, 1926. He went south before the pneumonia cleared up, and developed severe attacks of asthma, which had continued off and on with greater or lesser severity till seen in May, 1927. It was found that ephedrine gr.  $\frac{3}{4}$  by mouth would keep him comfortable for six hours at a time. This was a great boon to one whose days and nights had been made hideous through violent asthmatic seizures.

Mr. J. F., aet. 60.—He developed a bronchitis which became chronic, and this summer, with the bronchitis, severe attacks of asthma. His condition was aggravated by an enlarged prostate and a badly infected bladder. His attending physician was using adrenalin in ten minim doses every four hours during the day, and every two to three hours at night, to control his spasms. It was suggested that he use ephedrine, and he found that with three-quarters of a grain doses by mouth he could cut down very materially the number of doses of adrenalin in the twenty-four hours, but could not entirely dispense with it for the severe spasms. The explanation given by Chen is that adrenalin is a stronger broncho-dilator than ephedrine, and was necessary in the case just cited to overcome violent spasms.

It is not uniformly successful. One patient, Mr. R. J. B., aged 39, has suffered from chronic bronchitis with asthma at night for years. For the night spasms he was given ephedrine in three-quarters of a grain doses, and reported that while the drug relieved his spasm for the night, it also kept him awake, and on that account he refused to take it. This untoward effect is probably the result of direct cerebral stimulation, as noted by Airilia<sup>9</sup> and Morita,<sup>10</sup> whereby rabbits narcotized by chloral are

awakened by a therapeutic dose of ephedrine.

Another untoward effect seen recently was profuse sweating. This patient had a history of bronchial asthma. Tonsillectomy, followed by bronchitis and later broncho-pneumonia, aggravated his spasms in the early stages of the complication. Ephedrine in three-quarters of a grain doses relieved the spasm, but each time caused such profuse sweating for five or six hours that the drug had to be stopped.

Miller<sup>11</sup> found that ephedrine given by mouth improved six out of seven cases in asthma. In four cases it gave complete relief. In two others it reduced markedly the numbers of epinephrine injections that were required. Middleton and Chen,<sup>12</sup> also Mearn, had similar experiences, the latter in the asthma associated with chronic bronchitis.

Ephedrine proved useful also in a case of angio-neurotic oedema. Mr. T. A., aged 22, for the past seven months had been frequently troubled with the above complaint. Relief could be obtained from swelling and itching for a period of five hours by a three-quarters of a grain dose of ephedrine.

#### CONCLUSION

1. Ephedrine was used in twelve cases of

asthma associated with chronic bronchitis. Of these nine were completely relieved of their spasms, but two could not take the drug; in one case owing to sleeplessness, in the other to the profuse sweating produced. Two were partly relieved: one not reported on.

2. In comparison with adrenalin, the following advantages are outstanding: (a) That the drug can be taken by mouth. (b) The effect is much more prolonged: a single dose relieving for as long as six to eight hours.

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## THE LIFE AND WORK OF LOUIS PASTEUR\*

By D. R. DUNLOP, M.B.

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PASTEUR'S ancestors were nearly all tillers of the soil. They were serfs to the Counts of Adressier. His great-grandfather, Claude Pasteur was possessed of some ambition, and this, with the love of adventure, caused him to seek independence. So he detached himself from the home of his seven brothers in the Jura and took up his habitation in the Salins. This deed cost him ninety-six livres, but procured for him and his unborn posterity the right to the franchise. Claude's grandson, Gene Joseph Pasteur, became Louis Pasteur's father. He served with distinction in the Peninsular War, where he held the rank of sergeant-major. After the crushing of the Emperor, he returned

to his former trade, that of a tanner, and married Jeanne Etchennette Roque. Four years after their marriage, on December 27, 1822, Louis Pasteur was born.

Louis Pasteur's earliest education was obtained at the primary school attached to the College of Arbois. During his early schooling he gave evidence of no unusual talent. He was an extremely sensitive child, and his doors were open only to a very few of his most intimate school friends.

The head-master of the Arbois College was apparently the first to perceive that Pasteur's mind, while it worked slowly, was unusually conscientious. He assured the father that he had observed in the son this excellent quality; he never supposed "this" nor guessed "that",

\* An abstract of a paper read before the Calgary Medical Society, Nov. 1, 1927.

but waited until he was absolutely sure of a thing. After much persuasion this teacher induced the father, in 1838, to send Louis, for his higher education, to Paris. He entered a school in the Latin quarter, but his homesickness became so acute that his father, a month later, had to take him home.

He was now sent to college at Besançon where he sought to prepare himself for entrance, at a later date, to the Ecole Normale. At Besançon he earned money to pay for his board by giving private lessons. In 1840 he obtained the degree of Bachelor of Letters, and in 1842 Bachelor of Science. He had won no special distinction at examinations, when he returned for a second attempt on Paris at the end of 1842. After a year of lectures at the famous Sorbonne he was admitted, fourth on the list, to the Ecole Normale. In his earlier college days he had taught mathematics and physics, but on entering the Normal School, which was a training school for young men of science, his interest centred on chemistry. When, a few years later, this tyro astonished Biot, head of the Normal School, with his researches in crystals few dreamed of the scientific revolution he was preparing.

He was short of stature, of plain features with broad forehead, and would have passed unnoticed anywhere, except for a pair of curiously deep gray-green eyes, and the drag of his left leg, the result of a paralytic stroke when he was forty-six years old. He is said to have been a man of intense likes and dislikes, quick to form an impression and, as a result of the stroke, irritable and rather brusque in his manner. In contrast with this, he possessed an unusual tenderness for suffering, and always had an indomitable sense of duty.

The life of Pasteur has been said to typify the spirit of the sincere and devout modernist. He believed in life and in progress, in spiritual and intellectual evolution. He was a man of high ideals and aspirations, always sincere and determined, and he adhered to faith in a mysterious and divine purpose in the universe. History records no instance where a life more typically justifies such belief; no other has contributed so much towards the physical wellbeing of mankind.

His first title to fame was the result of his striking researches at the early age of twenty-

six when he made out the molecular disymmetry of certain crystalline substances, notably tartaric and para-tartaric acid. Thus he founded one of the most wonderful departments of modern chemistry. He foresaw the consequences of his discovery, and thus wrote, "There are wonders hidden in crystallization, and through it, the most construction of substances will one day be revealed."

At this stage of his life he was made Professor of Physics at the Dijon Lycée. This appointment was not particularly pleasing either to Pasteur or his colleagues, and he complained that the preparing of his lessons took up a great deal of his time. After a short interval, he was appointed to a faculty in Strassburg. Here to his list of friends was added the new Rector of the Academy of Strassburg, M. Laurent, and in the family of Laurent, Pasteur, for the first time in his life, came under an influence that was powerful enough to detract for a time his attention from his work. For, only two weeks after his arrival, he proposed for the hand of his friend's daughter Marie. The young lady, with wise prescience, accepted him with the firm resolution that his laboratory under all circumstances must come first. He was not only privileged, but encouraged, to return to his tartaric acid crystals! This research, indeed, led him straight to the realm of ferments, on which subject he worked for more than twenty-five years.

Up to the year 1850 many regarded the phenomenon of fermentation as strange and obscure. Conflicting opinions were held. Here, again, Pasteur's opportunity came. In 1856, a Lille manufacturer and many others were disappointed over the manufacture of beetroot alcohol, not only was the production unsatisfactory, but their wines and beers were turning sour. They, therefore, sought advice from Pasteur, who was at the time Dean of Lille University. Pasteur, always ready to devote his energies to discovering the causes of failure, set to work with his microscope and a little coke stove to examine the globules in the fermentation juice.

In these studies Pasteur observed through the microscope that globules were round when fermentation was healthy, that they were lengthened when alteration began, and were

quite long when fermentation became lactic. He discovered, also, that a microscopic fungus had the powers of transforming wine into vinegar. The facts he sought next to establish were: (1) That ferments are living beings. (2) That there is a special ferment corresponding to each kind of fermentation. (3) That ferments are not born spontaneously.

While he was still studying crystals microbes were being brought to public attention by Cagniard Latour, a Frenchman, and Schwann, a German. The former had observed that buds sprouted from tiny globules of yeast and he declared these yeast particles were alive and multiplied. The latter had declared that meat only became putrid when sub-visible organisms got into it. He had stated that if meat were thoroughly boiled, put into a clean bottle, and air led into it through red-hot pipes, the meat would remain fresh for months, but that within a few days after it was exposed to ordinary air it became putrid and teemed with minute living organisms.

In elucidating this problem Pasteur was entirely successful. He proved that alcoholic fermentation was due to yeasts; when the liquors spoiled it was due to the production of lactic acid by another type of organism altogether.

When he had solved the puzzle, it is related that he gave one terrific shout, "Eureka. Here are myriads of the tiny rods, they multiply and are alive". And to Madame Pasteur he said, "I'll come to dinner now," but for hours he did not come.

All his work was, in this connection, performed without the assistance of even a boy to wash the bottles. His only assistant was his wife who, in the words of Roux, "loved him even to the point of understanding his work."

At the conclusion of his great work on fermentation he was made Administrator and Director of Scientific Studies in the Normal School and moved to Paris.

At this stage of his experiments Liebig, the world's greatest chemist at the time, made a very disquieting announcement to the effect that yeasts have nothing to do with turning sugar into alcohol, that for this purpose the presence of albumen is necessary and that the breaking down of the albumen carries the sugar down with it into alcohol. This naturally

caused Pasteur many restless days and sleepless nights, but by a convincing series of experiments he was at last able to prove that yeasts and yeasts alone turned sugar into alcohol.

About 1865, while absorbed in his ferments, an epidemic was destroying the silk industry throughout the world. Japan alone appeared to have healthy silk-worms. J. B. Dumas, a great scientist, whose birthplace had been Alais, where this industry was now practically ruined, appealed to Pasteur to save the situation. Pasteur replied, "Your proposition throws me into a great perplexity; it is indeed most flattering and the object is a high one, but it troubles me and embarrasses me. Remember, if you please, that I have never even touched a silk-worm."—"Do as you like with me," Dumas answered, "the distress is beyond anything you can imagine." Thereupon, Pasteur proceeded to Alais to make a study of silk-worm disease. The story of his triumph is entrancing, but too long to tell here. He soon saw light in the mysterious disease, commonly called "Pébrine" that was destroying the nurseries. But, before long he found some inconsistencies in his observations which greatly puzzled him. At last he realized that the cause of the trouble was a dual one. It was with something like a cry of despair that he exclaimed, "Il y a deux." He had found a new disease—flacherie.

While Pasteur was carrying on his vigorous campaign to overcome silk-worm disease, he was met with every kind of quack, and opposed by egg dealers who had selfish motives to serve. They succeeded in so poisoning the minds of the uninformed populace as to have him driven from Alais and even pelted with stones. His labours were long and patient. During the first year of his efforts he was able to satisfy himself as to the causes of silk-worm disease and the methods required to eradicate it, but it required five years of experiment for final triumph and proof.

Some years later chicken cholera was causing the death of 90 out of every 100 chickens. About 1880, a microbe was described by an Italian veterinary surgeon, who demonstrated that it was the cause of the virulence in the blood. He sent to Pasteur the head of a cock that had died of cholera. Pasteur succeeded

in growing the organism on a special broth and showed that hens contracted this disease by the intestinal route. He found that when he inoculated a hen from a culture flask of chicken cholera microbe of not more than twenty-four hours' growth it showed the usual virulence, but when an old culture was used, one that had been put away for a few weeks, the hen would get sick and then recover. The same hen inoculated with a fresh culture showed full resistance to its action. Thus, he learned how to produce immunity, and his attention became concentrated on how to protect domestic animals against virulent diseases through the culture of some vaccinating-virus. He expressed the wish that he might live long enough to do something to preserve humanity from those contagious diseases which were continually decimating it.

In 1877, Pasteur undertook the study of "Charbon" or Splenic Fever. This scourge was deadly to agricultural industries throughout a large part of France. From 10 to 20 sheep out of every 100 died of it, and in certain parts of France the lands were looked upon as accursed.

Before Pasteur's time little cylindrical rods had been found in the blood of animals dying of splenic fever. These were spoken of as vibrios or bacteridæ, and Pasteur surmised that they might act in the manner of ferments. In 1876, Koch found that when such blood was inoculated into guinea-pigs, rabbits, and mice, these animals died of anthrax. Doubt on the point was thrown by Paul Bert who, in 1877, announced that he could destroy the bacillus of anthrax in a drop of blood, then use that drop for inoculation, and so reproduce the disease and cause death without any trace of the bacteria. His conclusion was that it therefore must be due to a virus. This is where Pasteur stepped in. By his process of culture he showed that the rods (bacteridæ) which existed in the blood were living beings, capable of being indefinitely reproduced in suitable liquids. He also showed that the germs or spores were capable of reproduction.

The next question to be settled in this respect was the following: Certain scientists had caused death through the blood of a splenic fever victim, but no bacteridæ could be demonstrated afterwards. Pasteur tried to place him-

self in the position of these observers. He first learned that the blood had been drawn, on a midsummer day, from a cow and a sheep which had died of anthrax. But that blood had been obtained twenty-four hours before the experiment. He sought to collect blood from dead animals in the same neighbourhood, but gave instructions that the carcasses of such animals should be kept for him for two or three days. He obtained blood from a sheep which had been dead sixteen hours, blood from a horse which had died on the preceding day, and blood from a cow on the third day after her death. The blood from the sheep contained bacteridæ of anthrax only, that from the horse bacteridæ and putrefaction vibrios, while that from the cow contained the bacteridæ and a much greater proportion of vibrios. The sheep's blood inoculated into guinea pigs caused anthrax, while inoculation with the blood from the cow and the horse caused speedy death with no bacteridæ. Now, a veterinary surgeon, M. Signal, when a commission had been formed to ascertain if possible the truth of Pasteur's contentions, asphyxiated a horse which was in excellent health, claiming that the blood taken from a healthy slaughtered animal would become violently virulent in sixteen hours, that it would contain bacteridæ similar to the bacillus anthracis so that animals inoculated with it would die with all the symptoms of splenic fever. He thereupon called upon Pasteur to expose the deep veins of this horse and claimed that Pasteur with his own experiments could prove to the commission that his, Pasteur's, contentions were not sound. Pasteur demonstrated from this blood a long translucent vibrio, creeping, flexible, and slipping between the globules of blood as a serpent slips between the high grasses. It was the *vibrio septique*. This vibrio swarms about the peritoneum and passes into the blood a few hours after death. It was the cause of septicæmia, and it was this vibrio of septicæmia that the other scientists had unknowingly inoculated into the animals upon which they experimented. Pasteur made successive cultures of the septic vibrio in a manner similar to that employed in the case of the bacillus anthracis, and proved that one drop from these cultures caused septicæmia in animals. He further proved the bacillus anthracis to be aerobic while the septic vibrio

was anaerobic. He succeeded also in separating the bacillus anthracis and the septic vibrio when they were temporarily associated.

The medical profession as a whole violently attacked Pasteur's germ theory, and loudly proclaimed the spontaneous generation of living organisms. Pasteur prophesied that the day would come—and that would be the supreme goal of his life work—when contagious and virulent diseases would be effaced from among the enemies of humanity. When this subject was again brought into controversy, Colin, who was a prominent leader of the scientific group who believed in spontaneous generation, and who vigorously and sometimes insolently denounced Pasteur's germ theory, and, in fact, opposed everything that Pasteur undertook, again came to the fore.

Pasteur had stated that chickens would not contract anthrax or splenic fever. Colin, at the Academy of Science, said he would present a chicken suffering, or dead, from anthrax. Months went by and at every meeting Pasteur asked him for the chicken, until finally he openly admitted that he was unable to induce anthrax in a chicken. Thereupon, Pasteur said he would bring him a chicken with anthrax. This he did in the following manner: Pasteur had found that the blood of a chicken was 4° C. higher than that of the other experimental animals. He took a number of chickens, inoculated them, and attached their feet to the bottom of a trough and placed cold water in the trough deep enough to submerge one-third of the body, where they were kept until their temperature dropped from their normal 42° C. to 38° C. One chicken he now wrapped in wool and placed it in a suitable heater where its temperature became normal; though sick it very soon recovered. Another, not so treated died, and was dissected in the presence of a Commission before whom Pasteur demonstrated the bacillus anthracis. By this time the germ theory was fairly established.

Now, by cultivating the bacillus of anthrax at a temperature slightly above that at which it thrives, he was able to produce a vaccine, which, when injected under the skin of an animal, would produce a mild form of the disease, and produce immunity from further attack.

After a long series of experiments, a final

test was carried out in the presence of physicians, veterinary surgeons, and agriculturists, as well as representatives of many newspapers. Forty-eight sheep, two goats, and ten head of cattle were set apart for demonstration purposes. On May 5, 1881, half of these were inoculated with preventive vaccine. Two weeks later, sixty of these animals were inoculated with the microbe of anthrax. Two days after the last inoculation, the distinguished company went to observe the result of this very important experiment. Every unprotected animal was either dead or dying, while every animal which had been protected by vaccination was in perfect health. Anthrax had lost its terrors, and with its passing began a new era in preventive medicine. This company, many of them scoffing skeptics, felt that a modern miracle had happened. The great de Blowitz cheered lustily, and sent the following telegram to his paper, *The London Times*, for distribution to the world: "The experiments at Pouilly-Le-Fort are a perfect, an unprecedented success."

For his discovery of splenic fever vaccination the Government offered Pasteur the Grand Cross of the Legion of Honour. This he would only accept on the condition that the order was also conferred on Roux and Chamberlin, who were his constant assistants.

Now we come to the crowning achievement of Pasteur's distinguished career, that of piercing the mysteries surrounding hydrophobia. Hydrophobia dates back to remotest antiquity. Throughout the centuries, although many remedies had been tried, no progress had been made and nothing better than cauterization had been found, as recommended by Celsus in the first century. Pasteur's mind was haunted with the constant danger to humanity from this dreadful disease.

After some months' experiments, he announced in March, 1885, that dogs could be vaccinated against rabies. He further announced that he dare not yet treat human beings after bites from rabid dogs, but that that time was not far off. To his son he wrote, "I am hardening myself by habit and conviction, in order to attempt preventive inoculation on man after a bite; practical applications on a large scale are not far off."

Hitherto, it had been generally accepted that the virus was confined to the salivary glands,

but Pasteur rejected this theory and discovered with absolute certainty that the seat of the disease lay in the nerve centres, particularly in the brain.

One hundred and twenty-five dogs were provided for experimentation. There were two series of experiments. The first consisted of preventive inoculation against rabies; the second in preventing the onset of rabies in the dogs bitten or subjected to inoculation. He resolved to collect saliva from the jaws of a mad dog. A mad bulldog was lassoed in its cage and held by two assistants. It was muzzled and, with a glass tube held between his lips, Pasteur drew the deadly saliva. The incubation period following the inoculation was often weeks and months. The saliva proved to be unsuitable for experiments, and some other means of obtaining satisfactory material for inoculation must be found. His next step was to search the nervous system. The observations of the action of the virus on a mad dog's nervous system were very instructive. First, there was the anguish and fury due to excitement of the gray cortex; this was followed by alteration of the voice and difficulty in deglutition. The medulla and the nerves starting from it were attacked in turn; lastly the spinal cord itself became invaded and paralysis closes the scene. When inoculated elsewhere than in the nervous system, the virus may remain for weeks or even months at the same point in the system, the virus may remain for weeks or even months at the same point in the body. This would explain the long incubation period, and the occasional escapes after bites from rabid dogs.

Pasteur therefore decided to inoculate directly on the surface of the dog's brain. A dog was chloroformed, the cranium trephined, the duramater exposed, and the prepared virus injected. The wound was washed with carbolic acid solution, and the opening closed. In fourteen days the dog was in rabid fury. Pasteur was unable to cultivate the microbe of hydrophobia, as he had been unable to detect it, although, to his mind, the existence of such a microbe admitted of no doubt. By a series of experiments on the medulla of rabbits he was able to determine the period of incubation, and his predictions of the time at which an inoculated animal would die were verified with surprising accuracy.

From the medulla of a rabbit which had just died of rabies a fragment was suspended by a thread in a sterilized tube, over which was placed a plug of cotton-wool to prevent the entrance of dust. The temperature of the room was maintained at 23° C. At the end of fourteen days it was found that its virulence had been extinguished. The medulla was now crushed and mixed with pure water and injected under the skin of dogs. The next day they were inoculated with medulla which had been dessicated for thirteen days, and so on, using material of increasing virulence, until the medulla was used of rabbits dead the same day. All these dogs were able to withstand the bites of rabid dogs and the intra-cranial injections of the deadly virus.

Pasteur, after these investigations, was satisfied that he had found a method of treatment, by means of which the development of hydrophobia can be prevented in a patient recently bitten by a mad dog. He therefore began the organization of a service against rabies. His first case for treatment of a human being was a nine year old Alsatian boy, Joseph Meister, who had been bitten by a mad dog. His method of treatment was the same in principle as that applied to experimental animals. He began with the mildest vaccine and inoculated with a stronger one each day until, at the end of fourteen days, he used the virus in its most powerful form. One can imagine the anxiety of Pasteur; doubly anxious, for he was not a physician, and had long since been obliged to retain young medical graduates as a protection against prosecution for practicing without a license. He had provided a bed for the child and his mother in his laboratory, where he watched the progress from day to day. The complete recovery of the lad satisfied him that he had led his fellow-man another great length in the conquest of human disease.

On his sixty-fourth anniversary he was awarded the Jean Reynard Prize for the conquest of rabies, and the subscription list was opened for building of the Pasteur Institute. Here, during the last seven years of his life, he organized the work in bacteriology. His first patient, Joseph Meister, is, or was recently, the caretaker of this institution.

For many years Pasteur had been a frequent attendant and took part in the discussions at

the Academy of Medicine. He was also a frequenter of the hospitals, where he preached surgical cleanliness by the free use of boiling water, and protection of wounds against contamination by improperly cleansed hands and unsuitable dressings. At one time, when maternal deaths from child-bed fever had reached its worst in Paris hospitals, Pasteur was listening to a very learned discourse from a famous physician, when suddenly he interrupted the speaker, telling him he was absolutely wrong about the cause of such deaths, and said, "It is you doctors who carry deadly microbes from sick women to healthy ones." The speaker replied, "Possibly you are right, but I fear you will never be able to find that microbe." By this time Pasteur was charging up the aisle, dragging his partially paralyzed leg. He rushed to the black board and exclaimed, "Man, I have found it! Here is the way it looks," and he drew a chain of little circles on the board, and the meeting broke up in confusion.

Pasteur may be regarded as the foundation of our whole scientific structure. He has been spoken of as the trunk of the tree; all the rest of our knowledge is but the growth of the branches. Perhaps this is pardonable exaggeration! He was by no means the first bacteriologist, but he was the first bacteriologist to achieve results of epochal importance. We see him climb every scale of the ladder from inorganic matter to man, physics, inorganic chemistry, organic chemistry, diseases of wines and beers, diseases of the silk-worm, diseases of poultry, sheep and other animals, and finally diseases of man.

Many men eminent in the field of medical research, such, for example, as Koch, Metchnikoff, Kitasato, Flexner, and others, have built upon Pasteur's theories, and even Lister, the father of antiseptic surgery, openly acknowledged that without Pasteur's discoveries, concerning the action of micro-organisms on wounds, his contributions to surgical science would not have been made.

Our serums and anti-toxins, whether used to secure immunity from disease or to fight some form of virulent infection, rest upon Pasteur's demonstrations, as does also the protection of our food and drink and much of our sanitary science. His name is a household word. Wherever milk is used with safety it is "pasteurized."

In conclusion, we recall that the honors he sought earlier in his life were denied him, such as election to the senate, but he had the satisfaction, to a greater degree than most great men of his type, of witnessing while he lived the erection of a memorial of one kind or another in every place where he had either lived or laboured. Honours were paid him by foreign lands. The Institut Pasteur in Paris was created to honour his achievements.

The Bonn University had long before conferred upon him an honorary degree which he returned after the Franco-Prussian War. Now the Berlin Academy of Sciences desired to know whether he would accept the "Order of Merit" at the hands of the German Emperor. He acknowledged with courteous thanks the honour done him as a scientist, but Germany could confer no honour on him while she held Alsace-Lorraine.

In the latter part of his life he would be seen, with step rendered heavy by age and ill-health, going from place to place, superintending and encouraging experimental work. He felt his life was ebbing, and that he had so little time for the great work he wished to accomplish. But he was at all times able to console himself in the fact that he was a teacher, and a regular army of scientists were getting their instructions directly or indirectly from his teachings.

On November 1, 1894, while in the midst of the greatest activity, he was about to pay his daily visit to his grand-children, when he was seized by a violent attack of uræmia from which he never fully recovered. A temporary improvement had taken place by the end of the year, and on January 1st, he had been visited by all his collaborators. "There is still a great deal to do," he sighed, as he affectionately pressed the hand of Dr. Roux.

His last days were spent at Villeneuve l'Etang, looking out at his faithful Roux, busy in the preparation and distribution of flasks of serum for the prevention of diphtheria. By the last of August he could scarcely walk, paralysis was increasing, and speech was becoming difficult. On September 27th, he was unable to swallow, and on the 28th, he passed away, one hand in that of his devoted wife, the other holding a crucifix. Since that date, in a crypt at the base of the Pasteur Institute, the greatest human benefactor of all time rests from his labours.

## Case Reports

### AN UNUSUAL CASE OF ACUTE ANTERIOR (EPIDEMIC) POLIOMYELITIS

BY RALPH P. SMITH, M.D., D.P.H.

*Professor of Pathology, Dalhousie University,  
Halifax*

The following case of infantile paralysis presented some interesting and unusual features.

The patient, R. W., aged 14 years, was admitted to the Victoria General Hospital, Halifax, on August 30, 1927, in a distressed condition, and unable to answer questions intelligibly. He had a history of having developed a sore throat on August 26, while swimming and, on leaving the water, an inability to swallow even fluids. As he did not improve, he was admitted for observation. Physical examination showed the boy to be poorly nourished; the tonsils were enlarged, but the throat was otherwise normal. A radiograph revealed nothing of note, and oesophagoscopic examination indicated that there was no obstruction from spasm or foreign body. A few hours later he became comatose, with a rise in temperature, and died on August 31. The temperature previous to the development of coma had been normal.

An autopsy was performed the day he died, and the findings were as follows: Nourishment poor; no marks of external violence except two small bruises on legs. The lungs, especially the right, were the seat of an early bronchopneumonia, with small sub-pleural haemorrhages, but without pleurisy. Beyond a few petechial haemorrhages under the epicardium, the heart was healthy, weighing 270 grammes. There was a degree of blood-staining of the aorta. The oesophagus appeared to be healthy, and there was nothing indicative of cardiospasm. The lymphoid tissue throughout the body was not unduly prominent, and did not suggest a *status thymico-lymphaticus*. The stomach was small and empty, except for some blackish mucus. In its submucosa were numerous petechial haemorrhages. The intestines showed a few similar haemorrhages, but no true inflammatory condition.

The brain and meninges, and the upper part of the spinal cord showed no gross change. The sulci of the brain were oedematous. On section, no gross change was seen, except a degree of hyperaemia, and a few minute haemorrhages on the surface and into the substance of the cerebrum.

#### HISTOLOGICAL EXAMINATION OF THE BRAIN AND SPINAL CORD

At the base of the brain, in the region of the pons, mid-brain, and medulla oblongata, the meninges were the seat of a slight localized acute fibrinous lepto-meningitis. A similar condition was present in the cervical portion of the spinal cord, where an extension of the inflammatory exudate along the arterioles in the anterior commissure into the grey matter of the anterior cornua could be traced.

The substance of the pons, mid-brain, and medulla showed oedema and hyperaemia of the blood-vessels, and the arterioles and pre-capillary veins had "collars" of inflammatory cells. In addition, especially in the medulla, there was a more diffuse inflammation, with commencing degeneration of the nerve cells. The inflammatory cells consisted for the most part of polymorphonuclear leucocytes, lymphocytes, and plasma cells. The changes were even more pronounced in the cervical portion of the cord, where many of the nerve-cells in the anterior cornua were more granular and vacuolated.

From the histological appearances, the diagnosis was clearly one of epidemic poliomyelitis of the bulbar type.

#### REMARKS

The possibility of this condition in the diagnosis of obscure cases with symptoms of bulbar type, associated with a history of sore throat, should not be overlooked. Dr. P. D. McLaren in a verbal communication states that two cases of similar nature, one of which also proved fatal, occurred about the same time in the village from which this patient came. The non-fatal case was a man of 60 years of age, who also had difficulty in swallowing, but made a gradual recovery. No *B. diphtheriae* were found in his throat. These patients were in no way related. It is of

interest to note that there had not been many cases of infantile paralysis at this time in the district, and that in this case fever was not prominent until within twenty-four hours of death.

I am indebted to Dr. Mathers for permission to use the notes of the clinical history.

#### AN UNUSUAL CASE OF TUBERCULOUS MENINGITIS\*

H. P. WRIGHT, M.D.

Montreal

R. D., male, aged 3 years, was admitted to the Royal Victoria Hospital, November 5, 1927.

He was born at full term by normal delivery. The first tooth appeared at the age of 10 months; he walked at 15 months. The feeding history was uneventful, and until the day of admission, he had apparently been in good health, except for an attack of measles.

On the day previous to admission the patient was seemingly in the best of health and was running about and playing, as he had been doing for the last year and a half. On the day of admission he awakened, at 5 a.m., was dressed, and allowed to play about the room. At 6 a.m. he had a convulsion, and the parents noticed twitching movements of the lips and face, and that he could not open his mouth. He was immediately brought into the hospital, and when first seen by me at 10 o'clock he was standing up in his cot, and presented the appearance of a perfectly normal child, save for the fact that he was extremely irritable, and one wondered if the irritability was not caused by his transference from an affectionate home into a hospital ward. There was no history of any other convulsion during his life. His diet was irrelevant, in that it was quite satisfactory, both for actual food factors and the accessory food factors. The mother (as is so often the case) attributed the convulsion to fright, and said that the child had been scared on Hallow'een.

*Family History.* An only child, with no history of tuberculosis or epilepsy; and otherwise quite irrelevant.

*Physical Examination.* On admission the child stood up in his cot, took an interest in his surroundings, and seemed to be perfectly normal in every respect, except for the irritability already

mentioned. The examination of the nervous system showed no evidence of paralysis or paresis. There was no stiffness of the neck, no Kernig's sign, and, except for the fact that the superficial abdominal reflexes were difficult to elicit, all the normal reflexes were present and no pathological ones could be obtained. There was no *tache cérébrale*. The pupils were equal, and re-acted to light and accommodation. The temperature on admission was 99.4°. The examination of the urine was essentially negative. The examination of the blood showed as follows: red blood cells, 4,760.00; white blood cells, 11,000; haemoglobin, 80 per cent; differential: polymorphonuclears, 56 per cent; lymphocytes, 42 per cent; eosinophiles, 1 per cent; basophiles, 1 per cent. The intradermal test to 1-10th of mgm. of tuberculin was moderately positive.

The child, therefore, seemed normal, except for his irritability, but the temperature persisted, so, on November 8, a lumbar puncture was performed, which revealed a clear fluid under no increased pressure, but with 150 cells per c.mm. These cells were almost entirely of the mononuclear type. The Pandy reaction was negative. The sugar in the cerebro-spinal fluid was 0.088 per cent (not reduced). A film formed with great difficulty in the spinal fluid. The examination for tubercle bacilli was negative.

The fever continued, and the child at this time appeared to be markedly drowsy, and it was frequently necessary to awaken him, to make a physical examination. No signs of paralysis were found. No stiffness of the neck or Kernig's sign was present. The examination of the fundi was negative. The skiagraph of the chest was also negative. The drowsiness increased, and, on November 12, another lumbar puncture was done, and 15 cc. of clear fluid were removed under slightly increased pressure. The Pandy reaction was negative. 500 cells per c.m.m. were found, which were largely of the mononuclear type; there were no tubercle bacilli. The Wassermann of the spinal fluid was reported as positive (+ +). The colloidal gold curve was  $\frac{1}{2}$ , 1, 1, 1,  $\frac{1}{2}$ ,  $\frac{1}{2}$ , 0, 0. The blood Wassermann was negative.

In the absence of any positive evidence of tuberculosis, except a moderate reaction to the intradermal injection of old tuberculin, the case was regarded as a possible one of encephalitis lethargica, and Dr. Arthur Young injected some of the cerebro-spinal fluid into the spinal canal of a rabbit. This rabbit was killed several days

\* Presented at a meeting of the Montreal Medico-Chirurgical Society, January 20, 1928.

later, and did not show the findings associated with cases of encephalitis.

From now on, the child became increasingly drowsy, and on November 20, slight resistance of the neck muscles was observed and Kernig's sign was positive. 20 c.c. of clear cerebro-spinal fluid were withdrawn. The Pandy reaction was negative, but there were 220 cells per c.mm.

On November 23, a lumbar puncture gave a clear fluid, with 159 cells per c.mm., and the sugar in the spinal fluid was 0.039 per cent, which was a definite reduction. A skiagram of the chest at this time was reported by Dr. Pirie to show no evidence of miliary tuberculosis. This was the fifth skiagram taken of the lungs since admission. The smears made from the pellicle were stained by the bacteriological department, and both the interne of the paediatric staff, and Dr. Beattie of the Department of Bacteriology, were unable to find the tubercle bacillus.

On November 25, the twenty-first day of the disease, a lumbar puncture was done and tubercle bacilli were found, and the child died.

An autopsy was performed with the usual findings of miliary tuberculosis, involving meninges, lungs, spleen, liver, and a caseous tuberculosis of the peribronchial lymph-nodes.

#### DISCUSSION

The case seems of interest for the following reasons:—

Because of the sudden onset: one convulsion, followed by no others and the child, on admission, appeared normal, except for his irritability, and a slight elevation in temperature. Two days later the intradermal tuberculin test having proved positive, tuberculosis had to be considered, but the child had reached the age when a positive tuberculin reaction did not necessarily mean miliary tuberculosis. However, as the drowsiness increased, it was thought advisable to do a lumbar puncture; a marked increase of the mononuclear cells was found, but with no diminution in the cerebro-spinal fluid sugar, while a diligent search did not demonstrate tubercle bacilli; no positive Pandy reaction, and the colloidal gold curve was difficult to place.

The progress of the case enabled one to make a pretty shrewd guess at the clinical diagnosis before any definite laboratory findings were brought forward, and it was only after physical signs of meningitis occurred that the Pandy test became positive, and the sugar in the cerebro-spinal fluid was reduced.

Lastly, though a diligent search was made on several occasions, only on the day of death were tubercle bacilli found in the cerebro-spinal fluid.

In many cases of tuberculous meningitis the x-ray picture of the lungs is of great help, and often tubercles are found in the fundi, but in this case neither the ophthalmologist, nor the roentgenologist were able to help in the diagnosis, and the only positive sign of tuberculosis was the presence of a positive intradermal reaction to 1-10th of a mgm. of tuberculin. No other positive sign of the presence of this disease was found until the condition had become so marked clinically, that a third year medical student should have been able to make the diagnosis on physical examination alone.

#### TRANSFIXION OF THE PERITONEAL CAVITY BY A BROKEN FORK-HANDLE

BY C. W. THORNE, M.D., C.M.,

*Melfort, Sask.*

A boy, 15 years old, on the evening of November 3, 1924, while pitching hay from a loft with a fork which had its handle broken off obliquely, threw the fork down into the hay, and then jumped upon it in the dark. The sharp end of the broken handle perforated the sheath of the left rectus abdominalis, about 8 cm. above Poupart's ligament.

On examination about 9 p.m., a gaping wound, about 3 cm. across, was found in the lower abdominal wall, showing muscle (rectus) beneath and discharging a slightly bloody fluid. Some swelling was present along the sheath, extending upwards about 10 or 12 cm. The boy complained of some pain and had some shock, but his general condition was fairly good.

After driving him in a car twenty miles to the hospital, an operation was performed to determine the extent of injury. On incising the anterior sheath of the rectus over the swelling, a loop of small intestine was found caught in the rent in the muscle, also some chaff and straw. The abdomen was then opened. The loop of intestine was found to have four perforations, about 2 cm. in diameter; two on the mesenteric side about 4 cm. apart, and two on the opposite side about 6 cm. apart. Evidently, the handle had passed through the loop and when the handle was withdrawn the loop had been pulled into

the abdominal wall. The damaged bowel was resected for about 10 cm. of its length. No further damage to the abdominal viscera was discovered. A rubber tube was inserted into the pelvis and a cigarette drain to the side of the damaged bowel, and the abdomen was closed.

There was never much discharge. The drains were removed in two days, and the boy made a good recovery. The temperature was never above 100° and he was discharged on the twelfth day.

While in hospital he complained of his back being sore over the left kidney, but this was not considered to be serious. In July, 1925, he came to my office with a fluctuating swelling in this area. This was incised, and some pus and dark material, evidently old blood clot, was removed. The condition was not thought to have any connection with the anterior abdominal wound.

The family then moved away. He was not seen again until January 9, 1928, (more than three years from the date of the original injury). He had a dressing over the left kidney region, and a sinus discharging a thin straw-coloured fluid, which sinus he stated had been there since the part was first opened.

The sinus was injected with barium and a roentgenogram taken. This showed a tract going downwards and anteriorly for about 6 cm., then turning abruptly upwards and anteriorly for about 2 cm. There was no evidence of any foreign body or diseased bone.

On January 13, 1928, he was operated on again. The sinus was dissected and traced through the back muscles. It was then found to pass beneath the 12th rib (left) and turn upward. Some material was felt in this part; a forceps was inserted, and a wedge-shaped piece of wood, 2 cm. long, 1 cm. wide, and 1/2 cm. thick at its base, was removed. The remaining sinus was cauterized, and the wound closed.

This piece of wood was evidently the tip of the handle which had caused the original wound. I believe it had traversed the whole abdominal cavity, from below anteriorly to the upper posterior part, and, after miraculously escaping the important structures it would have to pass, had come in contact with the anterior aspect of the 12th rib (left); after the handle had been removed the fragment had lain in that position for more than three years, the sinus fortunately

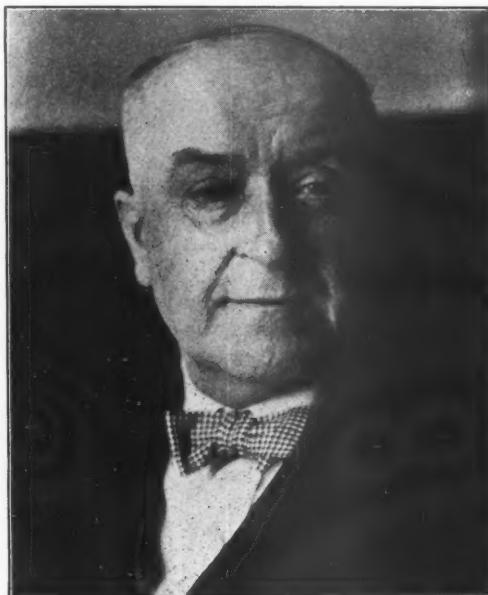
finding its way to the external surface, rather than following the recently opened course to the peritoneal cavity.

#### PLASTIC REPAIR OF THE RIGHT LOWER EYELID

BY S. HANFORD MCKEE, B.A., M.D.

*Montreal*

H. J. An adult male, of 47 years, was referred to me because of disfigurement in the region of the right lower eyelid, following the successful treatment of a rodent ulcer with radium. Examination of the affected area showed an apparent extensive ectropion, in that the lower palpebral conjunctiva was pulled downwards and was adherent below to scar-tissue. The conjunctiva was quite tense, the surrounding parts, watery; the patient, most uncomfortable. The dis-



Plastic Repair of right lower eyelid

figurement, too, was a serious handicap to him in his search for work. As the scar tissue and skin about the area were free from inflammation, it was decided to replace the absent lid by means of an epithelial outlay. Consequently, the patient was given a general anaesthetic and the usual preparation made. A lateral incision at the junction of the skin and conjunctiva was made completely across. The scar-tissue was removed,

and the submucous tissue dissected, until the conjunctiva was completely released and moved freely back to its proper position. After the bleeding was entirely stopped, a piece of dental compound was taken from hot water, which makes it easily mouldable, and made into the size and shape of the raw surface between the replaced conjunctiva above and the skin below. A Thiersch graft was then taken from the upper, inner region of the left arm, and wrapped about the compound, the skin surface being inside. The covered compound was then embedded in the space-lacking skin, and kept in position by four sutures. A large paraffin dressing was applied, the eye bandaged and kept so for five days. At the end of that time, the sutures were removed and the compound taken out. The graft had taken completely, but the tissues had contracted somewhat, leaving a raw surface at the outer side. Consequently, the operation was repeated at the outer canthus, adding enough graft to put the new lid in a good position. The patient has had no discomfort and although he has no punctum for tear-drainage below, the whole lower lid, having been formed by the graft from his arm, he has not had any discomfort from epiphora.

Two points in this operation should be emphasized. First, it is most important to take considerably more graft than one would think necessary, so as to allow for contraction. Most failures are due to neglect of this precaution. Second, when the compound is removed, there is found a consequent concavity which may be quite disconcerting. This need cause no misgiving. It is surprising how quickly the surface flattens and assumes a normal appearance. The photograph gives a good idea of the final result.

#### TRAUMATIC GLOSSITIS DUE TO IRRITANTS CONTAINED IN PLASTIC DENTURE MATERIALS

H. C. L. LINDSAY, M.D.

*Pasadena, California*

The patient, who is approximately thirty-four years of age, presented a definite glossitis along the median raphe of the tongue, which extended from a point in front of the circumvallate papillae on the oral part of the tongue to within two centimetres of the tip. Destruction of the conical papillae existed for nearly a centimetre on each side of the middle line, thus making an

irregularly elliptical lesion as demonstrated by the photogravure.

Irritation of the tongue coincided in time with the use of a new set of "false teeth." Both upper and lower sets were examined for physical or mechanical defects, but the result was negative.

With the co-operation of her physician, the upper plate was strapped to her arm for a few minutes, and then removed to see if any definite inflammatory reaction would develop. A marked reaction occurred, but upon the test being repeated with the lower set the artificial denture failed to produce any untoward effect. Thus, we came to the conclusion that the upper plate had been insufficiently "cured" in the vulcanizer, and had not been rendered inert by the baking to which it is usually submitted in the final stage of its preparation.



Glossitis, showing loss of conical papillæ due to chemicals in the new condensite plastic materials.

I have, during the last few years, repeatedly called the attention of my medical confrères in Vancouver to the fact that bakelite, such as we see in cigarette holders, causes inflammation of the lips in some people. Ghrist confirmed this point in an article published by Sutton. Trade dermatitis occurs in some instances among the workers manufacturing the new condensite plastic material. The compounds are known as synthetic resins and many of them appear to be basically the same as the various celluloid compounds used in the manufacture of plates for artificial dentures. I therefore suspected this plate. Three known dermatological irritants are contained in some of them when "under-cured" or

insufficiently baked, formaldehyde, phenol and an anilin dye.

In all probability these plates can be rendered inert by prolonged baking. The colour is not affected, nor is the material weakened by an exposure of two hours under fifty pounds pressure. The facility with which tinfoil is removed from the plate is an indication to the laboratory attendant as to the completeness of the "curing." If the tinfoil sticks, the plate must be returned to the vulcanizer for another period.

It may be that certain individuals exhibit some idiosyncrasies in their reactions to these materials. Many show a reaction to the old-fashioned vulcanite plates, and others cannot tolerate the re-

taining powders of gum tragacanth. I believe that the attention of both the medical and dental professions should be called to the importance of seeing that artificial dentures are as perfect as possible, in view of the fact that there is a tendency to develop cancers during the age when artificial dentures are mostly used, and that a continuous irritation of what Gaucher would have classified as a dermo-papillary mucous membrane must be avoided as far as possible. It is strongly recommended that, in cases of irritation within the oral cavity of individuals using artificial dentures, the latter should be examined from a chemical as well as physical standpoint.

## Clinical and Laboratory Notes

### A USEFUL BURETTE ATTACHMENT\*

By E. M. WATSON, M.D.

*London, Ontario*

Not infrequently, during the conduct of routine clinical laboratory work, it is more convenient to measure a reagent from a burette than to use a pipette for the same purpose. The burette, connected with a stock-bottle, serves both as a receptacle for the solution and a means for delivering required amounts of it. Consequently, much time is saved in the carrying out of quantitative estimations. The method is perhaps not as strictly accurate as the use of the pipette, but it satisfies the requirements of most ordinary clinical laboratory procedures, such as the determination of the blood sugar. Among the more practical disadvantages of the custom may be mentioned the tendency for salts to precipitate from solution about the tip of the burette, causing occlusion of its opening; also, the inconvenience occasioned by the sticking of glass stop-cocks, when such are used.

These drawbacks may be largely overcome by the employment of a device similar to that shown in the accompanying diagrams. The outflow of fluid from the burette is controlled by a piece of rubber tubing, which possesses within its lumen a glass bead (A). When the burette is not in use (Fig. 1), its tip is enclosed by a large test-tube (B), the mouth of which fits tightly around a rubber collar (C) attached to the burette. The evaporation of liquid at the tip is thereby minimized and salt precipitation prevented.

Should any leakage occur, the drops are caught in the tube which is supported by an attachment (D) clamped to the burette. This is so made that when the cup is lowered, as during the time when the burette is in use, it can be swung to the side out of the way and remains so suspended (Fig. 2) until, on the completion of

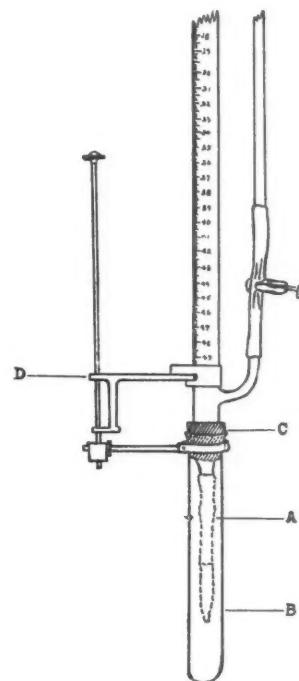


FIG. 1.

\* From the laboratory of Pathological Chemistry, Medical School, University of Western Ontario.

titration, it is returned again to its original position (Fig. 1).

No originality is claimed for this piece of apparatus. The above description is merely that

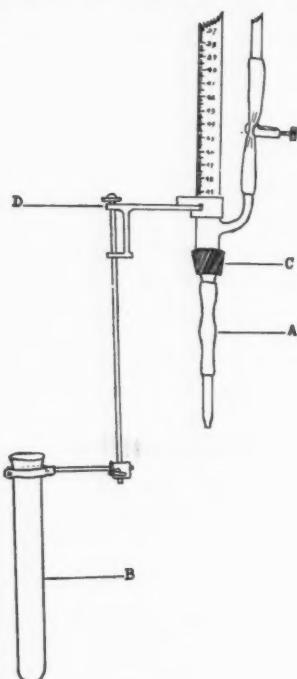


FIG. 2.

of a time-saving laboratory contrivance, which has been found to be useful when frequent measurements or titrations of solutions have to be made.

#### USE AND TESTING OF SPHYGMOMANOMETERS\*

This publication contains a brief discussion of the characteristics of blood-pressure in the human body, a description of the methods and instruments used in measuring arterial blood pressure, and a résumé of the results obtained in an investigation of the performance of the pressure indicators used in blood-pressure measure. Standard tests have, accordingly, been formulated and tolerances for accuracy established. In carrying out the work the recommendations of leading authorities on blood pressure were given careful consideration.

\* J. L. Wilson, H. N. Eaton, H. B. Henrickson, *Technologic Papers of the Bureau of Standards*, No. 352, Bureau of Standards, Dept. of Commerce, Washington, U.S.A.

The different methods of taking blood-pressure readings are considered, and the preference given to the auscultatory, which is in accord with the general opinion. The various sources of error, including the personal equation, are dealt with.

Three types of sphygmomanometers were investigated, the mercurial manometer, the aneroid, and the aerial compression. The mercurial manometer was found to be the most exact, though a very small amount of dirt on the wall of the glass tube, or on the surface of the mercurial column, will suffice to produce a serious error. The tolerances adopted as a result of these studies are, that the error at any point in any of the tests of either type of instrument shall not exceed three millimetres. The difference of pressure necessary to move the pointer or the mercury meniscus through any 30-millimetre interval must not be less than 27 nor more than 33 millimetres of mercury. Excessively irregular motion of the pointer or excessive sticking of the mercury column shall be considered a sufficient cause for rejection of the instrument. Certified sphygmomanometers can now be obtained, with a statement of the actual calibration. Thus it is possible, if required, to pick out a specially accurate instrument.

A. G. NICHOLLS

#### THE TECHNIQUE OF VACCINATION BY PUNCTURE, AS ADVISED BY THE FEDERAL DEPARTMENT OF HEALTH

"The skin of the outer surface of the arm is thoroughly cleansed with soap and water, followed by swabbing with alcohol. A drop of vaccine is then placed on the cleansed and dried surface. A sterilized needle, held in a position almost parallel to the surface of the skin, is then gently pushed through the drop of vaccine into the skin for a distance of about one-sixteenth of an inch. The point of the needle passes along beneath the epidermis and the vaccine is thereby deposited on the papillary surface of the true skin. Blood is not drawn. It is not necessary to wait for the vaccine to dry. The excess may be wiped off immediately. The use of a bandage is optional. *Shields should be sedulously avoided.* If two punctures are made they should not be at a greater distance than one-eighth of an inch apart, so that they may merge to make one sore. There is nothing to be gained by making two distinct vaccinations."

This is substantially the method adopted originally by Jenner.

## Reviews and Retrospects

### THE EVOLUTION OF THE IDEA OF THE LIVER TREATMENT IN PERNICIOUS ANÆMIA\*

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It is not proposed in this paper to speak on the application of the liver-extract treatment of pernicious anaemia. This should be reserved for some member of those institutions into which enter cases of this disease in considerable numbers, for he only will be able to speak with that certainty which comes of great experience. It must, however, be of interest to the practitioners of medicine to know just how it has come about that the hoped for cure (if "cure" it shall be proved to be) of one of our hitherto most fatal maladies has been found to be something within the reach of all, something which, oddly enough, has always been under our eyes as a rather ordinary part of the butcher-store's exhibit. Further than this, most of us have felt, I fancy, like Naaman when told to wash in the Jordan seven times to cure his leprosy, and have wondered if it was likely that such an easily found remedy could have real value. Needless to say, the idea which came to Minot<sup>1</sup> of using liver-extracts in the treatment of anaemia was no acquiring of some passing phantasy; years of patient study by eminent physiologists and clinicians had preceded his putting into practice the principles which at present seem to be steadily pushing away from us the malignant spectre of pernicious anaemia. As often happens, however, his was the mind that saw the connection between the many details which were appearing in a picture as yet but roughly sketched.

It is perhaps too early to speak of the cure of pernicious anaemia, when one realizes that the characteristic feature of the disease is that of remissions which may allow a patient to live in comfort for several years, yet, wherever the treatment has been persistently carried out, one still may say that "Every prospect pleases," after a period of more than two years, and that everywhere one hears that, judged by critical scientific methods, the liver-extract has a definite

effect upon the bone-marrow and the production of red cells. Such details as these however must be left for someone who may be describing the technique and application of the treatment. It will be sufficient to-night to go over those steps which have lead up to the rebuilding of our ideas concerning the cause and treatment of pernicious anaemia.

As often happens in the erecting of a new structure, much that is old has to be ruthlessly scrapped. The theories which suggested that pernicious anaemia might be the result of an infection, of an intoxication by the absorption of fatty acids or like bodies, of a haemolytic agent, have had at least to be put aside for the moment, if not actually thrown away. Before much progress could be made there had to be a rigid inspection of the etiological foundations supporting the structure of pernicious anaemia, and it appeared that nothing solid lay under the theory of infection, and that much that was crumbling was beneath the idea that poisons of the nature of fatty acids and lipoids, or of the substances resembling the extracts of tapeworms were responsible for the disease picture. For many years the profession had been unduly influenced by the statements of Tallqvist,<sup>2</sup> Faust,<sup>3</sup> Schau-  
man,<sup>4</sup> and Adler<sup>5</sup> that oleic acid, olive oil and cotton seed oil injected into or fed to animals produced a pernicious anaemia-like condition of the blood. Poisoning by fatty matter extracts of the food, or by a perverted secretion of the intestinal wall, as the cause of pernicious anaemia, became an almost accepted idea and when it was announced that the extracted matter of the fish tape-worm materially and suggestively altered the shape of the cells when mixed with them in the test tube, or produced a real anaemia in animals when injected into them, one felt that the problem of the etiology of essential anaemias was very near solution, more particularly since it had been recognized that the tape-worm anaemia was at times almost indistinguishable from the true Addisonian type.

It is with pleasure in this connection that one notes the work of W. F. McPhedran in 1913, when, with the late Dr. Peabody of Boston, he demonstrated that the various fatty acids of tissues, supposedly so deadly in their action when absorbed, were no more toxic and haemolytic than the oleic acid produced in the digestion of fat. Meulengracht purged us of what remained of the tape-worm fallacy, by giving us the first-hand evidence from northern Europe, that of 20,000,000 people infected with

\* Read before the Academy of Medicine, Toronto, December 13, 1927.

the worm, only an infinitesimal few ever showed anaemia, and fewer yet showed the picture considered typical of the pernicious type. The more accurate methods of examination of to-day have failed to show that intoxication from fatty acids or tissue extracts has any very definite relationship to pernicious anaemia.

Six to seven years after McPhedran's publication, one finds statements by various writers, Feigl and Mosenthal in particular, that *they are quite unable to prove this relationship*, and a few years later appear the papers of Gibson and Campbell Howard,<sup>7</sup> of Iowa City, (now at McGill), very convincing demonstrations that although occasionally in pernicious anaemia the fatty acids and lipoids of the blood are high and the cholesterol low, yet that the finding is not peculiar to pernicious anaemia, and is by no means a constant association of the disease. They state, "Our results indicate that increase in the unsaturated fatty acids in the blood cannot be a factor for haemolysis in pernicious anaemia."

With the theory of infection stacked aside, and the field cleared of the fatty-acid-lipoid wreckage, there appeared for a new upbuilding, foundation stones of a more solid and satisfactory sort. The studies on nutrition by McCollum, Benedict, Osborne, Mendel, and many others, had indicated clearly that growth and health depended upon proper diet. Anaemias due to improper food-intake were detected and described. The anaemias met with in infants, as the result of continued feeding of milk, are perhaps the best example, and may be instanced as anaemias definitely due to iron-deficiency, since milk is notoriously poor in iron; one saw the same condition occasionally in the days when typhoid patients were fed on milk alone. A distinct step forward was made when it was realized that in the smaller herbivora a very acute anaemia could be produced by attempting to maintain them on milk diet. When it was subsequently discovered that vitamine E of their vegetable food was necessary in order to ensure the taking up of iron into their blood, it seemed as if the riddle of the primary anaemias was well in process of being solved. Gibson and Howard go so far as to say that vitamine deficiency may well be a predisposing factor for the acute exacerbations, and may delay the onset and progress of the remissions in pernicious anaemia. How near these observers came to making a great discovery can be judged by the sentence, "From the limited number of cases reported here in which we have given adequate and iron-rich diets we have found little difficulty in establishing favourable iron-balances along with clinical improvement and lessened recourse to transfusions. Our results would tend to confirm those of Whipple<sup>8</sup> and his associates, who found that

in experimental haemorrhagic anaemia in dogs, blood-regeneration is hastened on a diet containing meat, liver, and other iron-rich foods."

At this stage, one must retrace steps to 1921, when the work of Whipple and his associates appeared as contribution after contribution on the subject of regeneration of the blood subsequent to the producing of an anaemia by repeated bleeding. Of the many articles of food which may hasten blood formation in animals (dogs being used because omnivorous), flesh seemed to stand easily foremost and in a paragraph of their summary one reads, "Cooked liver is as efficient as meat, and may be even more efficient in promoting complete blood regeneration subsequent to a standard anaemia. Blood regeneration may be completed in two to four weeks." And again "The liver residue has greater influence upon the blood-regeneration than has the watery extract, but the difference is not striking. Cooked liver is able to induce blood regeneration even under the most unfavourable conditions." As has happened before, however, it was the physiologist who most benefited by Whipple's numerous suggestions, and one notices throughout his many contributions in 1921 that they are the simple statement of facts as concerns repair of an artificially induced anaemia.

The profession had had a long and unsatisfactory experience with the dietetic treatment of pernicious anaemia. Treatment by various diets and articles of food is as old as the disease itself. We have had to admit, however, that any attempts in the dietetic treatment had never been carefully checked up by examination of the excreta of the body to see in what proportion the various food-stuffs could be absorbed by an anaemic patient. It was only in comparatively recent years that such scientific proving of diets was undertaken. Mosenthal<sup>9</sup> in 1919 had had suggestive results in three cases of pernicious anaemia, and in one of secondary anaemia, with forced feeding with high protein diets. Other observers had shown that proteins, fed in large amounts to cases of pernicious anaemia, could be taken up and used in the body, but, as is evident by the remarks of Gibson and Howard four years later, liver meant nothing more than meat to most clinicians, and Whipple's experiments were not considered germane to the subject of primary anaemia. The idea that in pernicious anaemia there existed some active blood destroyer probably kept most of us from seeing the real import of Whipple's work.

In 1921 and 1922, however, there appeared some clinical observations of extraordinary value. Ashby,<sup>10</sup> on the one hand, Wearn, Warren, and Ames,<sup>11</sup> on the other, put forth articles which seemed to indicate that no blood destroying agent or toxin was at the bottom of the

blood-poverty of pernicious anæmia. One might almost say that by such ideas we were deprived of an article of our religion, for as concerns primary progressive anæmia we had come to feel that blood-destruction in the marrow and circulation, and lemon tinting of the skin, were simply cause and effect, clearly in evidence and association, and that as a result of blood-destruction the marrow, unable to meet the heavy drafts made upon it, reverted to its infantile form. One sees at once that if pernicious anæmia was no longer to be looked upon as a hæmolytic anæmia a complete re-arrangement of the ideas as to its causation was now in order.

With fatty acids now in the discard, with the existence of active blood-destroying toxins actually in question, it was not surprising to find the profession swinging somewhat to the idea that vitamine deficiency lay beneath the Addisonian anæmia. We had known of the suggestive blood condition occasionally found in scurvy, sprue, beri-beri, and pellagra; we also realized that the cure of these conditions depended on their vitamine supply. Many of us still clung, however, to the bacterial intoxication idea—an intoxication made possible by the achlorhydria and co-existing mal-functioning of the gastric and duodenal mucous membrane. We have already alluded to vitamine E, and its necessity for blood-regeneration and iron-absorption in the anæmia of herbivora. There were many who put forth claims for vitamine A which, as concerns animals at least, rival those made now by the advocates of liver-feeding as a treatment for human anæmia, Koessler, Maurer, and Loughlin's<sup>12</sup> description of the production and cure of anæmia in rodents and their far-reaching conclusions should be consulted by all students of the anæmias.

Progress in America at this particular time did not seem to go beyond the suspicion that pernicious anæmia was a disease due to vitamine deficiency, or to some upsetting of the body's economy by infection with the bacillus Welchii or other organisms. The scene of activities seemed to shift now for a while to Europe, and we listened eagerly to Faber<sup>13</sup> and Meulengracht,<sup>14</sup> as they stressed the importance of achlorhydria, which, as an inherited or acquired peculiarity, might lead its possessor up against certain abnormal conditions of his surroundings, and thus invite a development of the pernicious or essential anæmia. One of Meulengracht's suppositions was, for instance, that the normal subject infected with the tape-worm gets the secondary anæmia while the achlorhydric may develop a pernicious anæmia-like form. Food-deficiencies, intoxications, bacterial poisons, might take the place of the tape-worm as the precipitating cause, and we must admit that even to-day we cannot say

that this may not be the ground-plan of pernicious anæmia. Just about this time, in 1925, came the second remarkable series of contributions from Whipple<sup>15</sup> and his co-workers. In them is seen now, however, the insistence that liver was a specific for the regeneration of blood in the hæmorrhagic anæmias of animals. To quote some of the most vital of his statements is to let one see how important has been all the recent work on the pigment-forming function of the liver. His work of four years previously, as gone over and confirmed, makes it everywhere apparent that liver is the great blood maker. "Beef liver feeding in severe anæmia is associated with a maximal regeneration of hæmoglobin and red cells. Abundant liver feeding for two weeks may cause the production of 90 to 100 grammes of hæmoglobin, over and above the maintenance factor. How may we explain this remarkable reaction due to liver-feeding? In our opinion this is evidence that the body stores in the liver parent substances which are used in the construction of hæmoglobin and red cells. This confirms our belief that the liver is concerned, not only with the making of bile-pigments, but with the production and storage of some parent substances used in the manufacture of hæmoglobin and red cells. Liver feeding in these severe anæmias remains the most potent factor for the sustained production of hæmoglobin and red cells, as indicated in the various tables." It would seem that statements such as these should have reached and convinced us all, but as was probable the dead hand of hæmalysis lay heavy on us, and the failure heretofore to produce any systematic betterment with a light or easily digested diet in pernicious anæmia had made us wary of listening to anything that sounded like a dietary fad. However, with the work of Ashby, Wearn, and others in mind, suggesting that there is no blood-destroying toxin actually at work in pernicious anæmia, with Whipple's insistence that liver and its extracts were the specific stimulants of the bone-marrow, returned the idea that pernicious anæmia is primarily a disease of the bone-marrow, due to some deficiency in a stimulus which promoted the proper formation of normal red-cells from the cells of the marrow. Peabody's<sup>16</sup> interesting studies upon the marrow in pernicious anæmia, from specimens taken during life, demonstrate the megaloblasts and megalocytes almost like tumour-growths, suggesting a crowded cluster of fruit which has failed to ripen, and Minot's<sup>17</sup> suggestion was quickly made thereafter that in essential anæmia the something to ripen these marrow-cells is contained in liver, as demonstrated by the increased red cell formation after liver-feeding in the experimental anæmias.

We were not to slumber indefinitely. It

was but a short step to the trying out of the idea, and a year later began to appear from the Harvard clinics papers by Minot and Murphy, Fitz,<sup>18</sup> and others, which seem to indicate that the cure for pernicious anæmia has been found. Everything points now to the correctness of the idea. We no longer think that pernicious anæmia is due to haemolysis or blood destruction. The lemon tint of the skin and the pigmentation mean, not the destruction of cells, but the deposition in the tissue of pigment which should have gone into the blood were there enough cells to take it up, and were the stimulus from the liver not missing. Under the liver-treatment there appears at once in the blood the new young red cell—the reticulocyte—the specific reaction to the treatment. Achlorhydria remains yet to be explained in its occurrence, as does the cord condition, the fat deposition, and the curious fatty degeneration. Two or three years is perhaps a short period of elapsed time in which to speak of cure of pernicious anæmia, but as Cabot<sup>19</sup> states, no one method of treatment has been associated with such prompt occurrence of remissions, and nothing has so far offered such hope of improvement and cure in pernicious anæmia as the liver-feeding.

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## FACTORS CONCERNED IN THE PRODUCTION OF OEDEMA

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The nature of the relationship between oedema and disease of the kidney is a problem which has confronted clinicians ever since the days of Richard Bright. Vitalists have tried to explain it on the basis of a perversion of selective activity of capillary endothelium, or of renal epithelium. Members of the mechanistic school point to changes in capillary permeability and pressure, or to changes in the osmotic pressure of the blood-plasma. Others believe that a derangement of the mineral-salt-equilibrium of the body is the important change underlying its production. It is, of course, a fact that changes in the osmotic pressure of the plasma, and in the salt content of the blood and tissues, do occur in nephritis, but these isolated observations are only steps towards the ultimate solution. In the nephroses, where the amount of oedema is prodigious, the kidney changes have been pronounced secondary to metabolic disturbances, which are looked upon as the cause of both. If this be true, and inasmuch as cases of nephrosis are said to progress to true parenchymatous nephritis, it at once raises the question as to whether all states of generalized oedema, not dependent upon circulatory failure, may not be due to some fundamental metabolic disturbance to which the lesions in the kidney are also secondary. We then assume that the nephritis, or nephrosis, as the case may be, is, like the oedema, a part and parcel of the more general disturbance.

## THE RÔLE OF THE BLOOD-PLASMA PROTEINS

In 1896, Starling demonstrated that the proteins of the blood-plasma have a very definite but variable osmotic pressure, and he suggested that this pressure, counterbalanced by the hydrostatic pressure of the blood within the vessel, was the mechanism by which fluid equilibrium between the blood and the interstitial fluids was maintained. Subsequent experimental investigations have served to verify this hypothesis. Bayliss has given the following description of what takes place within the capillaries. The blood in passing from the arterial terminations through the capillary bed traverses regions of diminishing hydrostatic pressure. At first this hydrostatic pressure (*i.e.* blood pressure at any point) is greater than the osmotic pressure of the plasma proteins. This is the territory of filtration of fluid from the blood to the tissues. There must, therefore, be a point where the two opposing forces are counterbalanced. From this point onward the hydrostatic pressure is lower than the opposing force. Here the osmotic pressure of the plasma proteins of the blood withdraws fluid from the tissue spaces. If, however, this osmotic force is feeble, fluid will accumulate within the tissue spaces—which condition we term oedema.

In alteration of the permeability of the capillary to the blood proteins, as in local injury, other factors must be considered. What then are the factors which may influence (a) the hydrostatic pressure within the capillaries, and (b) the osmotic pressure of the plasma-proteins? Undisputable measurements of the hydrostatic pressure within that portion of the capillary where filtration takes place have never been made on man. However, the pressure within the prevenous capillaries (where reabsorption takes place) is known with considerable exactness. Carrier and Rehberg have succeeded in measuring this pressure by means of very fine pipettes, actually introduced into the prevenous capillaries of the cuticle of the finger. They found that the pressure depends upon the position of the hand. If the limb is lowered the increase in pressure is proportional to the distance lowered. If raised, however, the pressure remains unaltered, due to collapse of the veins which thus oppose the return flow. This explanation was offered by Krogh. Other factors influencing capillary pressure are the valves of the veins, and the degree of muscular tone. Under conditions of lowered muscular tone, as in the weak flabby muscles of senility, or when the valves are damaged as in varicose veins, the hydrostatic pressure within these vessels may exceed the osmotic pressure of the plasma. When either of these conditions occurs in the extremities, a filtration oedema of the limb results, even though the venous pressure elsewhere may be normal.

The osmotic pressure of the blood-plasma proteins, which is the force opposing the hydrostatic pressure of the blood in the capillary, depends not only upon the amount of the proteins in the plasma, but upon their nature and relative proportion in the blood. These proteins are serum-albumin and serum-globulin, the fibrinogen having little effect upon the osmotic pressure. Since the osmotic pressure of the plasma is directly proportionate to the relative amounts of albumin and globulin in it, the lower their level, the lower the osmotic pressure, and the less the force tending towards reabsorption of fluid from the tissues. Normally, the proportion of serum-albumin to serum-globulin is three to one. The osmotic pressure exerted by a one per cent solution of serum-albumin is approximately 7.5 cm. of water, whereas that of a one per cent solution of serum-globulin is only about 2.0 cm. of water. In other words, given solutions of each, of equal concentration, the albuminous one will exert approximately four times the osmotic pressure as will the one containing the globulin. It therefore follows that any lowering of the serum-albumin, even though compensated for in amount by globulin, will hinder the normal return of fluid from the tissues to the blood, and favour the formation of oedema.

The extent to which this physiological equilibrium may be altered in diseases associated with oedema is considerable. Govaerts, in a study of the composition of the blood in various patho-

logical conditions, obtained the following results which are in the main confirmed by Linder, Lundsgaard, and Van Slyke.

Disease	Plasma-Proteins	Albumin-Globulin Ratio
1. Cir. myocarditis (slight oedema).....	Normal or increased	Normal
2. Mitral stenosis with oedema.....	Low	Diminished
3. Mitral stenosis (compensated).....	Normal	Normal
4. Hypertensive nephritis.	Increased	Normal
5. Glomerulo-nephritis with oedema.....	Low	Diminished
6. Nephroses.....	Very low	Reversal

Actual numerical values for the osmotic pressure of the plasma-proteins in nephritis, as obtained by various authors, are:

Normal	Nephritis with Oedema	Hypertensive Nephritis	Author
45-47	10		Krogh
35	15	40	Govaerts
35-40	12-30		Govaerts
34	14-26	34	Schade, etc.

(Values are in c.c. of water pressure)

In diseases featured by marked oedema it has thus been established that there is not only a lowering of the plasma proteins, but also a tendency towards reversal of the albumin-globulin ratio, which further promotes retention of fluids in the tissues.

#### RÔLE OF MINERAL SALTS IN THE BODY

The osmotic pressure of the blood proteins is, as mentioned, closely linked up with the mineral-salt-content of the body. It is recognized that the proteins of the blood are amphoteric, that is, they may enter into different combinations with its metallic ions, depending upon the reaction of the medium. For instance, albumin may be made to combine with sodium chloride as an albuminate of sodium, or as hydrochloride of albumin, simply by altering the hydrogen ion concentration of the solution. It is thus clear that any alteration of the sodium or the chlorine content of the blood will influence profoundly the value of the plasma-proteins. The intimate nature of these changes occurring in the circulating blood has never been satisfactorily worked out, though, as will be shown, they do occur. In 1901, Achard and Loeper ligated the renal pedicle in animals, and then injected solutions of sodium chloride into the blood-stream. They found that the sodium chloride rapidly left the blood and entered the tissues, with the production of oedema. When the clamp was taken off the pedicle, the oedema disappeared, and the salt was excreted by the kidneys. These experiments were the first to show that the isotonicity between the blood and the tissues is maintained in part, if not entirely, by the sodium chloride, and that the level of this salt in the blood is regulated by the kidney. Three years later, Widal showed that there is a retention of sodium chloride in

nephritis with oedema, and he concluded that this retention was the cause of the oedema. However, in the following year Ambard and Beaujard found that there is chloride retention in some cases of dry nephritis. It was then discovered that in this type of nephritis the chloride radicle is retained in the blood, while the sodium is actually diminished, whereas in the wet type the reverse is true. It was not until 1926 that light was thrown upon the confusion which resulted from these observations. Blum (1926), working with oedematous nephritis, found that potassium or calcium combined with chloride is not only not retained by nephritis, but actually produces an elimination of sodium. At the same time, there occurred a diuresis with loss of oedema. He therefore concluded that retention of the sodium radicle alone is the cause of the oedema. This was confirmed experimentally by Mauriac and Aubel (1926), using dogs with a uranium nephritis. These investigators, in addition, showed that sodium as a sulphate, a citrate, an acetate, or a phosphate, would, if given, produce oedema. It was thus finally established that it is retention of the sodium radicle and not the chloride which favours the production of oedema.

There are then at least three pathological changes found in oedematous states, which combine to reduce the reabsorption of fluid from the tissues to the blood:—(a) Lowering of the plasma-protein level; (b) Reversal of the albumin-globulin ratio; (c) Retention of sodium. There

is a good deal of evidence to show that the lesions in the kidney are the cause of the sodium retention, but this cannot be said for the other two factors. The loss of the albumin in the urine can hardly be accepted as the cause of the loss of blood-protein, for this reduction may precede the albuminuria, or be present in cases where albuminuria does not occur.

It seems evident from clinical observations that not all of the oedema-producing forces have the same etiological importance in each case of anasarca. The lowering of the plasma-proteins and the reversal of the albumin-globulin ratio is known to occur with much greater regularity in the nephroses than in true parenchymatous nephritis, whereas sodium-retention is more often a feature of the latter.

When the investigation is carried one step farther back, and we inquire into the actual cause of these changes just discussed, the realm of speculation is reached. Here theory is neither hindered nor aided by cold fact: it reigns supreme. There can be little doubt but that pathological changes in the kidney are intimately involved, but whether as the exciting cause, or merely as part and parcel of a more generalized metabolic disturbance, is a subject of contention. The question still awaits solution.

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**Tuberculosis in Pregnancy.**—Dr. E. Rist (Paris) said that the belief of Hippocrates, that pregnancy was a cure for consumption, had not been fully eradicated; some medical men still believed that consumptive women could bear children without paying heavily. Since we had learned to distinguish between the infection and the disease we had ceased to rely on general symptoms. The most fundamental signs were the demonstration of a lesion by x-rays and the presence of bacilli in the sputum. While many cases of tuberculosis were overlooked it was by no means uncommon for other morbid conditions—some harmless, some serious—to be treated as tuberculous. It was this diagnostic doubt that accounted for the differences of opinion as to the effect of pregnancy. Statistics based on reliable diagnostic criteria invariably showed that pregnancy led to an aggravation of symptoms, to the extension of existing lesions, to the production of fresh ones, and to the flaring up of those quiescent. The few exceptions were women with very mild fibrotic tuberculosis. The speaker's figures showed that 89 per cent of his phthisical patients were made worse by pregnancy, and 58 per cent died after one or

two years. Most commonly the patient had been in good health before pregnancy, and consumptive symptoms appeared during pregnancy or the puerperium. There was no better criterion of cure in a treated tuberculous woman than the ability to bear a child without mishap. It had been found that 20 per cent or more of pregnant women lost their capacity of giving a positive skin reaction to tuberculin and only recovered it some time after parturition. Pregnancy seemed to be one of the causes which diminished the specific allergic resistance to tuberculosis, but the reason was far from clear. Dr. E. Coulard, of Paris, had shown that abortion and castration had the same effect, while the advent of puberty or the menopause and of each pre-menstrual phase might be accompanied by a marked failing of the skin reaction. The effect of menstruation on tuberculous symptoms was well known, and a high proportion of cases occurring in later life began at the menopause, while Coulard had collected a number of cases where it followed double ovariectomy. In his opinion the hyperactivity of the thyroid was the connecting link. People with an abnormally low thyroid action rarely got consumption, and then only in a mild form.

## Editorial

### CONCENTRATION OF THE BLOOD AND ITS IMPORTANCE

THE phrase "concentration of the blood" is often used glibly, without a very clear idea of what is implied thereby. It is, in fact, one of those convenient generalities which tempt the medical man to guess at the existence of some particular pathological state, rather than to make sure of the matter by applying the appropriate tests. Yet, since blood-concentration is not infrequent, and its consequences, both immediate and remote, may be momentous, it is important that we should be precisely informed about it.

Water is the most abundant single chemical substance in the body. It is, also, one of the most essential. Life without water would be impossible. Water carries food substances, renders metabolism possible, equalizes the temperature of the body, and promotes excretion. To perform these varied and basic functions efficiently, the proportion of water, both in the blood and in the tissues, must be kept within certain fairly definite limits. Fortunately, the maintenance of the necessary equilibrium is not easily disturbed.

By "concentration of the blood" is ordinarily meant a state in which there is an increase in the number of the red corpuscles per cubic millimetre above a certain norm. We generally take 5,000,000 to be this norm. But, if we regard this as a hard and fast number, and an exact statement, we are liable to err grossly. As a matter of fact, the number of the erythrocytes, as determined by the haemacytometer, varies greatly, and this within normal limits. Several factors are, no doubt, concerned in this, but one of the chief of them may be mentioned, namely, altitude. Thus, Gottstein gives the figure for Berlin, with an altitude of fifty feet above sea level, as 4,647,500. Contrast this with 8,000,000 for the Cordilleras, which are 4,392 feet high (Viault). On this basis, the figure for eastern Canada (St. Lawrence Valley) is nearer 6,000,000 than 5,000,000. For the Montreal district about 5,500,000 would be expected. It is, therefore, neces-

sary, in estimating the degree of blood concentration by means of a cell-count, to take into account this matter of altitude. To illustrate, a figure of 6,000,000 or more at the sea-level might have considerable significance. The essential point in all this is that the normal figure for the blood-cells should be established for each particular district so as to provide a proper standard for comparison.

An increase in the cell-content of the blood is, however, not the only factor to be regarded in this matter. Concentration may be due, also, to an excess of salts, carbohydrates, or albuminous substances in the plasma. This fact is not generally appreciated. Examples of this are found in pneumonia and in the hyperglycæmia of diabetes. In order to obtain precise information in a given case, it is necessary, not only to estimate the number of the corpuscles, but to determine the density of the blood as well, by methods such as those of Hammerschlag or Schmaltz. Only in this way will it be possible to determine whether there is more than one factor at work, and to select the appropriate remedy.

Under physiological conditions the density of the blood oscillates between 1058 and 1060 on an average, though somewhat wide variations may occur. Thus, during pregnancy the density may be from 1050 to 1056; and in the newborn child it may reach even as high as 1080. In pathological states the variations may be still greater. In pernicious anaemia the density is often quite low, from 1017 to 1030; in chlorosis it is rather better, 1045. In hydropic states generally the density is lessened, to 1022, for example. On the other hand, it rises considerably in polycythaemia, tuberculosis and splenomegaly. In general, it may be said, that the density tends to fall in all cases where there is destruction of the blood corpuscles.

Concentration (anhydramia) is particularly likely to occur in the case of the nursing infant, as its water requirements are high

and are apt to be overlooked. Here, obviously, the fault is in an insufficient intake of water. The same result may be brought about by the too free elimination of the water already in the tissues, as in vomiting, diarrhoea, polyuria, and profuse sweating. Other conditions in which anhydæmia is frequently found are, pneumonia, fulminating influenza, superficial burns, gas-poisoning, eclampsia and in some, but not all, cases of surgical shock.

The results of even a slight degree of anhydæmia are by no means trivial. The circulation of the blood and lymph is impaired, and metabolism is hampered in all the important glandular organs. In severer cases the heat-regulating mechanism is upset as well; in the most extreme, thrombosis, and even death, may result.

It should not be overlooked, furthermore, that there is a close affinity between the concentration or density of the blood and another of its qualities, namely, its viscosity. As a matter of fact, the viscosity is, for the most part, dependent on the same factors—polycythaemia, retention of salts, excess of carbohydrates, increase in albumin, and too great elimination of fluids. The importance of this association lies in the fact that there is a constant relation between the viscosity of the blood and its tension. A thick, sticky, blood means a more sluggish circulation, increased work for the heart, higher blood pressure, and, therefore, an increased tendency towards arteriosclerosis.

It would, on the surface, appear to be a simple matter to cope with this important condition. Actually, it is not so simple. Where anhydæmia is due to too little intake of water, or too great out-put, all that has to be done is to supply more water, by the mouth, by intravenous saline, or by enema, as the case demands. Here, the regulating mechanism of the capillaries is intact. But, in cases of inflammation, as Underhill has pointed out (*Annals of Surgery*, 1925; 81; 840.) in connection with burns of the skin, the capillaries are more permeable, a more concentrated plasma passes out, and the *status quo ante* is not so readily restored. Consequently, to get the desired result, the supply of water must be continuous or frequently repeated. In connection with the treatment of shock, it is important to remember that anhydæmia, while usually present in that form supervening on abdominal operations, is not consistently to be found in other varieties. It is, therefore, imperative, in any given case of surgical shock, that accurate determinations of the cell content and density of the blood be made in order that scientific measures for relief may be resorted to. In fact, wherever blood-concentration is suspected, at least where the condition may be clinically important, it will be wise to place the matter beyond the possibility of a peradventure by instituting the appropriate laboratory tests.

A. G. NICHOLLS

#### TONIC HARDENING OF THE COLON

**D**ISTURBANCES of the function of the large bowel have been the subject of much discussion and dissension within the past twenty-five years. Metchnikoff and Lane attacked the problem, but in their enthusiasm they claimed too much. In the inevitable reaction to their methods the good points and the bad were equally submerged. Adami, criticizing Lane's work, exploded the bogey of "auto-intoxication" and was of the opinion that "sub-infection" was the cause of much of the mischief in the disorders of function of the large intestine. Lane attributed the cause of chronic stasis of the large gut to two main causes—"bands"

and visceroptosis. The time has passed when every surgeon looked for "Lane's kink" and when the enthusiastic supporters of his theories removed the whole of the "cesspool" of the large intestine. Dr. Stacey Wilson in a recently published book\* has brought forward again the problem of chronic intestinal stasis under a new name, "Tonic Hardening of the Colon."

When one looks into the reasons for the failure of methods of treatments which once had great vogue, one finds that, after the

\* TONIC HARDENING OF THE COLON. T. Stacey Wilson, M.D., B.Sc., F.R.C.P. 210 pages. Price, \$2.50. Oxford University Press. McAinch & Co., Toronto, 1927.

periods of scepticism and enthusiasm had passed, the reaction to these methods became marked as the false premises of their originators were exposed by experimental work. So it is with treatments of all kinds, and only those which are built on a good foundation of physiology and pharmacology survive the fires of criticism and experiment. Dr. Wilson brings forward a series of cases which exhibit a single feature common to them all—a condition of the large gut which is manifested by a fixation of the muscular wall in a contracted state. The contraction is not due to fibrous tissue, but to a rigidity of the muscle fibres themselves, so that they cause a damning back of the intestinal contents above the site of the contraction. When the muscle fibres are so fixed, they behave as elastic tissue and consequently the peristaltic wave is stopped at the site of the contraction. It is unfortunate that Dr. Wilson has not brought forward experimental work on the gut to support his thesis.

To explain the condition as due to a toxin (of probable intestinal origin) only sets back the solution until the toxin has been found. There appear to be at least three ways in which the toxin can act—directly on the

muscle fibres, on the ganglion cells of Auerbach's plexus, or on the cells of origin of the sympathetic nerves to the stomach. Experiment alone will determine the mode of action.

The treatment suggested for the condition—a combination of salol and hyoscyamus—is unfortunate, after the recent work on the pharmacology of salol. The antiseptic substances liberated by the decomposition of salol in the intestine are never in a concentration sufficient to effect any adequate sterilization. It may be that Dr. Wilson believes that the phenol and benzoic acid may have the effect of neutralizing the toxin which causes the condition, but he does not state this.

An examination of his book leads to the conclusion that he has presented an hypothesis of intestinal stasis which is more attractive than the mechanistic theory of Lane, but one that must be tested out before it can be said that the treatment is based on a sound scientific basis. The cases presented are so divergent in their symptoms that they remind one of the claims of Lane. Further experience by clinicians will determine whether or not some pruning of the list is to be undertaken in the next edition of the book.

J. BEATTIE

#### HOW TO CURE A COLD

THIS title recalls to mind one of Mark Twain's whimsical essays, in which he portrays his experiences in attempting to cure a cold with the numerous remedies suggested to him by his friends. The impression lingers that there were as many "cures" as friends. Some of the remedies, undoubtedly, had merit. "Gin and onions" was one, we remember. One friend recommended a quart of whisky. Another friend recommended a quart of whisky. So, Mark took two quarts of whisky. Rather curiously, this drastic treatment did him no good. Failing a cure, he should have died, but did not. Had aspirin been invented in his day, no doubt he would have tried it. One line of treatment, recommended to the writer by a lay friend, maintains still a certain popularity. He said:—"Take three fingers of whisky (whatever this is!) in a tumblerful of hot water, a quinine pill, and a hot bath, and your cold will be gone in the morning."

Indeed, instituted early, this mode of therapy appears to be quite as good as any other.

One might gather from this that the medical profession has signally failed to cope with what is a very common and annoying complaint. The red eyes and the watery nose are, however, but transient phenomena, and the physician may put forward the excuse that he is not often consulted in the matter, unless the affection promises to get out of hand. And, yet, the "common cold" deserves more scientific consideration than it has hitherto received. A trivial ailment in most cases, it may be serious, on account of its sequelae, in the infant, the aged, and the feeble. Paradoxically, it is "not to be sneezed at," so to speak.

We note with interest that The Chemical Foundation has donated \$195,000 to the Johns Hopkins School of Hygiene and Public Health, for the purpose of encouraging an exhaustive research into the origin, nature

and possible cure of the common cold. The fund is to be known as "The John J. Abel Fund for Research on the Common Cold," in honour of the present incumbent of the Chair of Pharmacology in that University.

An esteemed contemporary suggests that this may be a "gesture of exasperation." Whether this be so or not, it is, also, a "gesture" of hope. It adds:—"To the uninstructed mind there is apt to be something incongruous in the spectacle of a physician lecturing on the progress of medical science to a sneezing audience." Medical men will readily admit that they feel more or less impotent in the face of this irritating affection. We presume, though we do not know, that "colds" are due to an infective cause, or causes. The epidemic course of the trouble certainly suggests this. At the present time, all will deprecate the unpleasant habit of coughing and sneezing in public places. The dainty perfumed square of linen, two inches by two inches, surrounded by a yard of lace, will come in for its share of condemnation. In fact, the handkerchief, as an institution, is a hygienic anachronism.

A polyvalent vaccine, made up from the microorganisms commonly to be found in the naso-pharynx in cases of coryza, when scientifically exhibited, appears in many cases to act as a prophylactic, but is of no value when the attack is well established. In unskilled hands it is probably worse than useless. Any immunity that is established is short-lived, unless maintained by occasional properly spaced doses, spread over the period during which "colds" are prevalent. At best, however, this is a "gun-shot prescription" and lacks precision.

The investigation proposed is fraught with difficulty. The relationship, if any, between "feverish colds," "la grippe" and "influenza"

must early be clarified. The bacterial flora of the nose and mouth is both abundant and varied, and the task of picking out one form as the offender above all others is not easy. Possibly, too, a filter-pass is at work, as has plausibly been advocated in the case of influenza. The influence of nasal obstruction and of infection of the accessory cavities needs further elucidation.

It is conceivable, also, that the infective nature of "colds" cannot be substantiated, and that the apparent epidemic incidence is to be explained on the basis of a number of physical factors operating together and at one particular time. "Colds" are more frequent during the winter months, beginning with November. Observations have shown recently that in England there are often two epidemic periods during this season. This has been connected with the conditions of rain, fog, smoke and the abrupt alterations in temperature which are so prevalent and exhibit a certain periodicity. Climatic conditions will, of course, vary in different countries, and this line of investigation will cover a broad field.

The importance of diet and fatigue in the etiology should not be forgotten. Too much carbohydrate in the food has been thought to predispose.

Sufficient has been said to indicate the many bearings of the problem to be solved. Its importance no one will question. The cause may prove to be illusive, but all would be pleased to see the matter cleared up. In the event that effective methods of control are not discovered, those who pin their faith to the well-tried methods of treatment referred to, at any rate will not incur the reproach of being out-of-date, and will, no doubt, have their consolations.

A. G. NICHOLLS

#### PUBLICITY AND HEALTH EDUCATION

THE Health Service of the Committee on Publicity and Health Education of the Canadian Medical Association was inaugurated on January 28th, 1928. The Health Service is designed to meet the public demand that exists for authoritative information as to how to live in order to maintain health and to prevent disease.

That there is such a demand is shown by the amount of space that newspapers and magazines give to the subject. It is evident that they have sensed the demand. There is no doubt but that the public has an ever-increasing appreciation that health is a desirable thing, and this appreciation is accompanied by a growing understanding

that there are certain things which should be known and practised.

The public has been confused with a variety of advice. To offset this, the Canadian Medical Association—the organized medical profession—will present to the public what is the accepted opinion on the various subjects which have to do with the maintenance of health and the prevention of disease.

This information will be put out in a series

of weekly newspaper articles and offered to all Canadian newspapers. They will be published in the name of the Association, under the heading "Health Service." Each article will be accompanied by the following:—"Questions addressed to the Canadian Medical Association, 184 College Street, Toronto, concerning health, will be answered. Questions as to diagnosis and treatment will *not* be answered."

#### THE ULTRAVIOLET RAYS IN THERAPEUTICS

**A**N event of more than ordinary importance, which should not be passed over by the conscientious chronicler, was the meeting of the First International Conference on Light and Heat in Medicine and Surgery, which took place at Westminster, London, from the 13th to the 16th of December, 1927. This gathering was exceedingly well attended and drew together many workers in this special field in Britain, as well as a small, but distinguished, contingent from Paris and Berlin. The papers, as a whole, were of a high class and the discussions were illuminating. In connection with the conference was an exhibit of the latest in ultraviolet-ray-producing lamps.

The impression that one gets from a perusal of the abstracts of the papers read on this occasion, which are all that are available for the moment, is that in the so-called ultraviolet radiation we are dealing with an agent fraught with great powers, both for weal and woe. Furthermore, those most conversant with its properties are modest enough to admit that they are merely at the threshold of what promises to be a great boon to man. In the midst of light, they are in relative darkness.

As has been the case in the past, when some spectacular discovery has been made, which has a bearing on the cure of human ills, so now, the possible benefits of ultraviolet therapy have been exploited well in advance by the pseudo-scientific, the quack, the charlatan, and the mere money-maker. Unless the tendency is checked, the outlook is alarming. Of one thing, at the present time, we can be quite certain, and this is, that so little is known with certainty about

the properties of ultraviolet and similar rays that this particular form of therapy is decidedly unsafe in the hands of any but trained medical men. It is decidedly not a fit plaything for the masseur, the medical gymnast, the chiropractor, or the barber. Yet, it is widely employed by just such persons. Among the apparatus demonstrated was an analyzing mercury-vapour lamp, used to show the different kinds of fluorescence set up when certain substances are exposed to the influence of filtered ultraviolet light. Thus, minute traces of arsenic in a liquid, mildew in wool, and many other things could be demonstrated. Perhaps as remarkable as anything, it was shown that various stages of "new-laidness" in eggs could be detected. We may eventually find, as has been hinted, that the up-to-date grocer will have to be added to the ranks, as he may in the near future be expected to install a mercury-vapour lamp on his counter, to demonstrate *ante oculos* the purity and blamelessness of his wares! Whatever usefulness ultraviolet rays may ultimately be found to possess in the detection of fraud in business, it seems clear that in such matters as diagnosis, the selection of cases, the prescription of treatment, the exhibition of the irradiation, the study of the reactions produced, and the initiation of any modifications that may be called for, are pre-eminently the province of the physician. Not only so, but before long, these matters will be largely beyond the ken of the ordinary practitioner. Ultraviolet therapy is speedily passing, with the exceptions above noted, into the hands of a specially trained brotherhood in our profession, and rightly so.

Much remains to be done. To prove the truth of this statement one has only to state a few of the problems that confront the workers in this special field. What is the admitted therapeutic and hygienic value of ordinary sunlight due to? Is it to be attributed solely to the ultraviolet rays, or do rays of other wave-lengths play a part? If so, what part? What is the rôle of the pigments in the body? Are the physiological effects of hormones identical with those that can be experimentally produced by photo-dynamic reactions? Are vitamins merely substances that are charged with various forms of radiant energy? How far may certain drugs be exhibited at the same time that irradiation is employed? To what extent can food-stuffs be irradiated, and in what degree, so as to be beneficial to health? It will take some time to answer these questions, and there are many more.

It is rather curious that the manufacturers of the various forms of lamps used in the production of ultraviolet and other rays

should have overlooked the urgent need of perfecting some form of actinometer whereby dosage could be accurately determined. As it is now, they seem to have confined their efforts to making lamps more powerful in certain directions, and in providing portable and more moderately priced instruments. The last-mentioned quality is, perhaps, as may be inferred, of doubtful value.

The many keen minds at work in this entrancing new specialty may be trusted to tackle the problems that are opening up in a thoroughly scientific manner, and we may hope before long to see order out of chaos. The prospect is indeed fair.

In this number of the *Journal* will be found, on another page, the first article of a special series on this subject, written by the Editor of *The British Journal of Actinotherapy* for the benefit of the general practitioner and others who find it difficult to obtain a simple presentment of this important matter.

A. G. NICHOLLS

#### SIR DAWSON WILLIAMS

THE resignation of Sir Dawson Williams from the editorship of the *British Medical Journal* is the subject of the following resolution by the Journal Committee of the British Medical Association:—

"The Journal Committee, meeting on the day on which he relinquishes the position of Editor after thirty years in that office, wishes to place on record its deep appreciation of the great services rendered to medical science and the medical profession by Sir Dawson Williams during his long and brilliant editorship; its gratitude for all he has done to advance the British Medical Association in every branch of its work; and its high regard and affection for him personally.

"The Committee trusts that in the leisure earned by forty-seven years of unselfish devotion to the *British Medical Journal*, during which he has raised it to the great position it occupies to-day, Sir Dawson Williams will renew his health to enjoy the honour and esteem in which he is universally held."

The *Journal* would like to add its note of appreciation of Sir Dawson Williams' work, and his unvarying interest in the development of medical journalism in Canada; and to join in the good wishes expressed by his colleagues.

#### Editorial Comments

##### THE BOSTON MEDICAL AND SURGICAL JOURNAL

Our contemporary, the *Boston Medical and Surgical Journal*, celebrated last month its century of publication, and we, representing the profession in Canada, desire to present our congratulations on the attainment of its centennial. Our contemporary is, so far as we know, the first medical journal on this Continent to be able

to look back upon such a long, successful, and unbroken record and the maintenance throughout this period of a very high standard of excellence.

The early decades of the past century witnessed the gradual emergence of medicine in America from a state of comparative ignorance and superstition to one of scientific investigation

and splendid achievement. Under the leadership of John Collins Warren and James Jackson, both recently returned from the medical schools of London, Edinburgh and Paris, the *New England Journal of Medicine and Surgery* was commenced in 1811 as a monthly magazine, and maintained a high reputation for more than a decade. After that time, however, contributions declined in number, and financial difficulties arose; difficulties which were not lessened when in 1823 the *Medical Intelligence* made its weekly appearance, with Dr. Coffin as editor and proprietor. It was soon realized, however, that the Boston of that day was too small to support more than one medical journal, and early in 1828 the two publications were united, and the *Boston Medical and Surgical Journal* made its appearance under the editorship of Dr. Warren, associated with an able and active staff of assistant editors. Busy as Dr. Warren then was, both with lectures in the Medical School and a large practice, he threw himself into this new adventure with heart and soul and soon raised the new issue to a high point of excellence.

Looking back on this labour of love, carried on during the past century by its several editors, we desire to recognize and acknowledge the stimulating influence exerted by the journal on American medicine. Published in Boston, the centre in those days of a glorious galaxy of literateurs, and under the supervision of Harvard University, its articles were ever characterized by a high standard of practical value and scientific accuracy, and its pages always evinced great literary excellence.

We understand that with its entrance on a new century the State Societies of New Hampshire and Vermont will be associated with that of Massachusetts and with local societies in Boston in the publication of the journal, which will hereafter assume the title of the *New England Medical and Surgical Journal*. We ourselves will miss its familiar title page on our table but we will look for the maintenance of its high standards and will hope that its influence will reach a greatly increased number of readers.

#### THE HARBEN LECTURES FOR 1928

We learn with pleasure that Dr. A. T. Henderson, Assistant Physician on the staff of the Royal Victoria Hospital, Montreal, and Demonstrator in Medicine at McGill University, has been appointed to deliver the Harben lectures in London for 1928. The selection of the lecturer in this instance is made by the Council of the Royal Institute of Public Health, London. The lectures are three in number and are to embody research in connection with some department of public health. They will subsequently be published in the *Journal of State Medicine*.

Dr. Henderson's many friends will join us in congratulations on his being selected for work in which he has been preceded by such well-known scientists as Dr. Simon Flexner, Professor Calmette, the late Professor Ehrlich, and other notable figures.

#### DR. WILDER PENFIELD

A new appointment on the staff of the medical faculty of McGill University has been made in the person of Dr. Wilder Penfield, who has been chosen for the clinical professorship of neurological surgery. Dr. Penfield is a graduate of Princeton, where he gained a Rhodes scholarship, and after taking his B.A. degree in Oxford began his studies in medicine there. He took his M.A. and B.Sc. degrees after studying under Professor Sherrington. In 1920 he became Beit Memorial Fellow at the National Hospital, Queen's Square, and here he worked under Mr. Percy Sargent, Dr. Gordon Holmes and Dr. Kinnier Wilson, all men of the first rank in neurological work. Dr. Penfield later spent some time studying under Cajal of Madrid.

With this solid background of preparation Dr. Penfield came back to New York and founded the Laboratory of Neurocytology, and was appointed assistant professor of surgery at Columbia University and attending neurologist at the Vanderbilt Clinic. He will take up his duties at McGill within the next six months.

#### A MEDICAL SCHOOL PROPOSED FOR THE UNIVERSITY OF BRITISH COLUMBIA

We gather from the *Vancouver Medical Bulletin* of December that there is a growing feeling that a medical school should be established in Vancouver, in connection with the University of British Columbia. The idea was first put forward in concrete form by Dr. Seldon in his Osler Lecture last year and since then it has been keenly discussed. The *Vancouver Medical Bulletin* points out how rapid the growth of the city is and urges that the medical profession of the province do its part in assisting this development. The *Bulletin* states:—

"This is not to say that we must forthwith build a medical school. But we must seriously study the question, and be ready with a clear-cut policy, based upon a thorough understanding. We must do more than this. As a strong and vigorous Association, with a membership past the two hundred mark, growing responsibilities devolve upon us, which are not met by the payment of our annual dues, and the holding of meetings. Nor are these responsibilities limited even by our Articles of Incorporation."

poration as a Benevolent Society. Since the majority of the medical men of the province reside in Vancouver, this must be the headquarters of medical organization for the whole province, and no sophistry of minding our own business can excuse us for failure in the duties that we owe to our fellows elsewhere, who are at our mercy—a fact that increases our responsibility towards them.

Post-graduate work will, more and more, be demanded of Vancouver, and we are not doing all we might in this direction. The east is generous, but untold good will accrue to Vancouver when it assumes its rightful position in this regard."

#### JOHN HUNTER

There is no anniversary in the calendar of medical history which recalls a more commanding figure than that of John Hunter. Born 200 years ago, his character and intellect have exerted an influence on the growth of medical knowledge which shows but little evidence of waning.

It would be well that the anniversaries of such great names should receive in our colleges a formal recognition, and we are glad therefore to publish in this issue an abstract of an address given by Dr. J. Beattie, Assistant Professor of Anatomy, to his class, on the morning of John Hunter's 200th anniversary.

### Special Articles

#### THE OBSTETRICIAN'S "RAISON D'ETRE"\*

BY KENNEDY C. MCILWRAITH, M.B.

*Associate Professor of Obstetrics, University of  
Toronto; Senior Obstetric Surgeon to  
The Burnside Hospital,  
Toronto*

Since animal life began, the struggle for existence has gone on unceasingly, and man has emerged victorious—but at a price. A large part of this price is paid by women in pain, morbidity, and death, in the process of reproduction. A physiological process undoubtedly, but no longer functioning physiologically, because of changed circumstance.

In the huge mass of writings by naturalists and hunters no reference can be found to pain, morbidity, or death attaching to the reproductive process of an animal in its primitive state. In the huge folk-lore of mankind there is scarcely a reference to such. Domestic animals, on the other hand, are highly civilized, and evidence of dystocia amongst them merely shows that they, too, pay the price. Historic man suffered, for by the time man had become historic he had been civilized. The nearer he is to his primal state, the less the burden. Evidence on this point is nebulous, perhaps, but all on the one side.

Sir Percy Scott,<sup>1</sup> for instance, describing shell transport by African women, writes as follows: "A woman carried forty pounds. One woman gave birth to a baby *en route*. She put it in the bush and went on with her load. On her return she picked it up, placed it in her empty packing

case, along with a bunch of bananas, and arrived at Cape Coast Castle, smoking and smiling, with the packing case, baby, and bananas on her head."

I have the following tale from an African missionary. "I was crossing my compound and saw a native woman in some difficulty. I found that she was giving birth to a baby—which she did, picked it up and went on her way with it."

A missionary to the Esquimaux on the shores of Hudson's Bay gave me this account. "An Esquimaux woman was starting on a journey with a sledge party. She went away, gave birth to a child, which she picked up and put on her back inside her fur, and went on with the party."

A rather more scientific account is to be found in the *American Journal of Physical Anthropology*, written by Dr. Philip Newton.<sup>2</sup> The subject is the Negritos of the Philippine Islands. The inhabitants of these islands are classified as "Pure-bloods" and mixed races. The "Pure-bloods" live chiefly in the hills, whither they have been driven in the struggle for existence. Amongst this pure blood race puberty begins about the age of twelve. Marriage is entered into at from fourteen to sixteen years of age. In pregnancy, morning sickness is unknown, dystocia is rare, and work is resumed on the third day. The process does not seem to differ so strikingly from ours in their case, but we must not forget that the race has been driven from its old temperate environment on the plains to the colder climate of the hills, and has doubtless suffered somewhat in the process.

You have heard stories of primitive Africans. Listen now to Williams<sup>3</sup> on their civilized mates. "Accordingly it would appear that in my service the usual types of contracted pelvis occur four or five times more frequently in black than in

\* Read before the Section of Obstetrics and Gynaecology, Academy of Medicine, Toronto, Jan. 5, 1928.

white women . . . that labour is not more disastrous to them is due to the fact that their children are smaller and have softer heads than those of white women." Also, to Dr. P. W. Tooms,<sup>4</sup> of Memphis, Tennessee; "We have a great many coloured patients. There are about ten cases of eclampsia in the coloured race to one in the white."

Now if it be true that dystocia is a consequence of civilization, what factors in civilization are responsible? Can any of them be altered, without great loss, so as to mend matters? Some causes can undoubtedly be traced.

The child-bearing period, as indicated by nature, is from 13 to 45 years of age approximately. Very young mothers usually give birth to children easily. Ossification of the pelvic joints has not begun, and the other tissues are softer. But in our generation the average primipara is more than twenty-one.

Primæval man lived under a law of the survival of the fittest, but this law has been partially abrogated by our professional efforts, and no other control substituted for it. The unfit survive and reproduce their kind.

The gathering of man into large communities seems to have increased the virulence and opportunity for the spread of infective organisms, and, for a time at least, to have reduced his resisting powers. In this connection one may quote the statistics recently published by Dr. Helen MacMurchy.<sup>5</sup> The maternal mortality in rural districts is 4.4, and in urban 6.6 per 1000 living births. Some years ago, two of our graduates took house-surgeonships in a city hospital, after some years in rural practice. They soon discovered that the technique which sufficed in the country would not serve in the hospital.

The effects of miscegenation are very marked. This question was ably dealt with by Dr. Walker before this section last autumn. He clearly showed that a brachycephalic woman when mated with one of her own race could produce brachycephalic children readily, but if mated with one of the longheaded race, dystocia was the usual result. Rapid transport has made this a much more important factor in modern times. Long ago if races mixed it was with a neighbouring race, and but little change was produced. But to-day races from all quarters of the earth meet and mix, especially in our new country. Rapid transport too has brought man into climates differing widely from his own, and exposed him to infections against which he has developed no immunity. The effects even of these known factors are but partially appreciated, and many of them have now passed beyond our control.

Let me refer to some other hypothetical questions. One such is the average weight of the

human foetus as compared with its mother, and the ratios existing in other viviparous animals. The gorilla, our nearest known relative, weighs about 300 lbs., and gives birth to a 4½ lb. offspring.<sup>6</sup> By analogy, a 150 lb. woman's child should weigh about 2¼ lbs., and the average human baby about 2 lbs., whereas the actual average is 7 to 7½ lbs. Our own black bear weighs 400 to 500 lbs. and produces a 10 to 12 oz. cub, in the hibernating season<sup>7</sup>—twilight sleep! It seems quite possible that civilization may have altered this factor adversely, and that it might be changed again for the better.

The length of the gestation period may also have been altered. There are undoubtedly instances of post-mature foetuses; some families throughout many branches never carry their children longer than 8 months. In this connection it is interesting to note that amongst viviparæ, the gestation period bears a more or less direct proportion to the size of the animal. That of the elephant in captivity is 22 months.<sup>8</sup>

Mental and moral problems also complicate our work. Difficulty in labour leads but too often to feeble-mindedness and other disabilities in the offspring, not perhaps transmissible. The feeble mind that is transmissible deserves a separate consideration. Two lines of work may help in this disordered state, the development of the obstetric art, and research into the physiology and pathology of reproduction. In the first of these departments we have no reason to be ashamed of our progress. Instruments and operations have been devised and applied with great surgical skill. The apparent impasse of contracted pelvis has been circumvented by the induction of premature labour or Cæsarean section. Most cases of placenta prævia are successfully treated, as far as the mother is concerned. Our pharmacological list is long and effective. Supervision of pregnancy has reduced the maternal mortality from eclampsia to almost nothing. The infections of lesser virulence have almost disappeared from our cases. Sources of auto-infection have been discovered and removed, and streptococcal infection itself more effectively dealt with. Pain has been greatly mitigated. Infant nutrition has been studied and premature infants saved.

In pathology we are not so far on in comparison with other branches. Of the genesis of the monstrosity, placenta prævia, hydatidiform mole, habitual intra-uterine death of the foetus, nothing is known. The origin of the toxæmias of pernicious vomiting and eclampsia has been anxiously sought, but is still obscure. The pathological influence of endocrine gland secretion is but little understood. Ninety-nine per cent of the pain of labour is abnormal, but we have as yet an imperfect understanding of the circumstances which have burdened this

physiological function with this pathological factor.

In physiology also we are far behind. In spite of the countless millions of viviparous births that have taken place on earth, no one positively knows why labour starts. We do not know what determines sex. The method by which qualities are transmitted has been shown and the slight control suggested has not been exercised. These and many other problems wait solution. It is impossible to overestimate their importance to the race of man; yet the physiology of reproduction is the least developed part of physiology.

To sum up, we may claim that our art is being kept well up to the standard of the times, but that there is an urgent need for more research in the physiology and pathology of reproduction.

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#### ULTRAVIOLET RADIATION FOR THE GENERAL PRACTITIONER (No. I)

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While the term ultraviolet irradiation is a convenient one for describing the treatment of disease by solar or similar rays produced from artificial sources, it is by no means strictly correct. When light is passed through an ordinary spectrum and allowed to impinge on a screen, you will find that it is split up into what are known as the primary colours. One end of the band is violet, followed in order by indigo, blue, green, yellow, orange, and lastly red. Beyond each end is darkness. If the prism of the spectrum be made of quartz instead of glass, and the light allowed to impinge on some sensitive photographic paper, it will be found that for a considerable distance beyond the violet end the paper will be blackened by invisible rays, the width of this blackened strip being much greater if the source of light be from a quartz mercury-vapour lamp than if it is coming direct from the sun. This shows, therefore, that the ultraviolet rays have the power of acting chemically on a photographic plate just the same as the other colours of the spectrum, with the possible exception of the red. With regard to this end, however, one would be more correct in stating that the chemical power of red light is extremely feeble, and not altogether absent, as can be proved by specially sensitive paper.

With regard to the red end of the spectrum, certain rays will be found to pass through it, whether it be made of glass or quartz. These rays are invisible, but their presence may be proved by a galvanometer. They have no *chemical* power in the sense that the ultraviolet rays have, but they have a great deal of *physical* power, inasmuch as they are capable of heating any body in the direct line of their radiations. Put in another way, if you proceed from the ultraviolet rays towards the infra-red rays the chemical power of the rays steadily decreases, while the heating power increases; if you proceed in the opposite direction, the heating power decreases, while the chemical power increases.

These are physical facts which must be kept steadily in view, for all the rays of the spectrum, from the ultraviolet ones to the infra-red, have their use in medicine in what is called ultraviolet therapy, though in the present state of our knowledge we are unable to assess the full value of each separate portion of the spectrum.

At the present time more is known of the use of the ultraviolet rays than of any other part of the spectrum, so much so that there is a tendency to value, not only the sun's rays, but those from artificial sources, on the *percentage of ultraviolet rays* only, leaving almost entirely out of account the other parts of the spectrum. From the undoubted benefits, however, of ordinary solar light on the animal and plant worlds, a strong suspicion is growing up that this attitude is wrong, and that visible light and infra-red rays play an important though largely unknown rôle, and it will be the business of future investigators to find out and tell us what this is.

In these articles it is not proposed to enter into the various theories of light. What is known as the "wave-theory" is the most generally accepted, because it explains practically all the known phenomena of this mysterious form of electromagnetic energy. Assuming then the "wave-theory" as correct, we must understand the methods of measuring the output of energy, which is done by reference to wave-lengths, frequency, or intensity.

The first-mentioned concerns the length of the waves measured from crest to crest or trough to trough; the second to the rapidity with which the waves oscillate; while the last may be defined as the quantity or energy of the light. Expressed in figures, the wave-length and frequency vary inversely, so that the longer the wave-length the fewer the number of vibrations, and *vice versa*. For instance, the wave-length of the extreme visible red is about 8,000 A.U., and its frequency 400 million millions; whereas the figures of violet are 4,000 A.U. and 800 million millions.

Beyond this very short explanation of the relationship between wave-length and frequency

it is not necessary to refer again to the matter, since the only unity of measurement we need keep in mind is the *wave-length*. The unit commonly used for measurement of the wave-length is the Greek letter for "m" (or micron)— $\mu$ . This signifies the millionth part of a metre, or the thousandth part of a millimetre (equals 0.0393707904 in.); it is also called the micro-millimetre, or, shortly, mm. Thus, using round numbers, the wave-lengths of the visible spectrum extend from 0.400  $\mu$  to 0.800  $\mu$ . Or, using the milli-micron (or 1/1,000th of a micron), which is written as  $m\mu$  or  $\mu\mu$ , the wave-lengths extend from 400  $\mu\mu$  to 800  $\mu\mu$ .

To avoid decimals altogether in dealing with these extremely minute fractions, one frequently sees them expressed in Angström Units. The A.U. is one-ten-millionth part of a millimetre, so all that is required is to multiply the micron by 10,000 or the milli-micron by 10; thus, 0.400  $\mu$  becomes 4,000 A.U. and 0.800  $\mu$  becomes 8,000 A.U. For practical purposes this is most convenient, and in this series of articles, unless otherwise stated, Angström Units will be used to express the wave-lengths.

Before proceeding further it may be advisable in this connection to define briefly a few other units which will crop up later, *viz.*, *ampères, volts, ohms and watts*.

Before giving any scientific definitions, one may translate these terms into popular language by using the analogy of the gas meter. In this way you can speak of the number of ampères as the amount of electricity passing through a meter; the number of volts, as the pressure or strength of the current; and of ohms, as the resistance to be overcome by the current in passing through various substances, such as conductors or wire, etc. In terms of gas, it means the friction of the gas on the pipes and round the many corners and angles through which it must pass. A watt, on the other hand, is really a *unit of energy*; and to continue our analogy of the gas, it may be defined as the amount of energy developed by a certain amount of current expressed in ampères (or cubic feet of gas) at a certain voltage (or pressure), and is therefore the product of these two.

In the next communication these units will be illustrated by reference to numbers.—*The British Journal of Actinotherapy*, January, 1928; Vol. II; 196.

## THE IMMORTALITY OF ANIMAL TISSUES AND ITS SIGNIFICANCE\*

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The body, as is well known, consists of myriads of cells organized as a harmonious whole. Since these cells are submitted to the rules of a dis-

ciplined community, they cannot display all their possible activities. Most of their potentialities remain virtual in normal life. It is during the development of pathological processes that they become actual. They are doubtless responsible for a number of important phenomena, such as inflammation, malignant tumours, wound-healing and others. This train of thought led me, more than sixteen years ago, to study the hidden powers of animal tissues. The surgical methods that I used at the beginning of this investigation soon proved to be inadequate. Fortunately, Harrison published at this time his well-known experiments on the survival *in vitro* of fragments of frog embryos, and demonstrated that tissue cells completely separated from the organism could multiply for a few days. His work was the starting point of the elaborate procedures that I have developed for obtaining pure strains of various cell-types, cultivating them in media of known chemical composition, measuring their rate of growth, etc. Through these methods, it became possible to observe under ideal conditions the fate of animal tissues when they are liberated from the restraint of the body.

The first experiment that gave a decisive result was undertaken on January 17, 1912. Several minute fragments from the heart of a chick embryo were cultivated according to a technique similar to that of Harrison. The bits of tissue went on pulsating and surrounded themselves with connective-tissue cells. But after a few days, pulsations and cell-migration ceased. Degeneration was imminent. An attempt was then made to prevent death by removing the waste products from the cultures. For this purpose, the tissues were thoroughly washed by placing them in a saline solution, and transferred into a fresh medium. Immediately, the heart tissue began pulsating again, and the cells migrated. This treatment was repeated every few days, and the little heart-fragments continued living and beating. However, they did not increase in size. On the contrary, they progressively diminished and faded away, or were killed by bacterial infection. Only one extremely minute fragment of heart remained alive and pulsating. But it was much smaller than a pin head, and could not have failed to disappear within a few days. Then, a drop of embryonic tissue juice was added to the medium. A truly wonderful effect was immediately observed. Fibroblasts began to multiply about the tiny pulsating heart muscle, which was soon surrounded by a large amount of tissue in which it disappeared. The tissues went on growing and could be divided into two parts, which also grew rapidly. Every forty-eight hours, the cultures were washed in Ringer solution by Ebeling or myself, divided into two parts, and cultivated again in embryonic juice. To-day, hundreds of experiments are made every month with the pure strain of fibroblasts descended from the tiny fragment of pulsating tissue that I possessed in 1912. The

\* Abstract of an address given at the Third Race Betterment Conference, on Jan. 2-6, 1928, at Battle Creek, Michigan.

colonies are cultivated in flasks with an oblique neck, which protects them from bacterial infection. They grow in a solid medium composed of diluted plasma. This medium is frequently washed in Tyrode solution. On its surface, some embryo juice or other substances used as a nutrient medium, are injected every two or three days. The rate of growth is ascertained by the increase of the area and volume of the colonies. We are entitled to consider the experiment as almost concluded, as it has lasted for a period of nearly sixteen years. Two important facts have been brought to light.

1. The fibroblasts derived from the original heart fragment manufacture large quantities of new tissue from the substances contained in the culture medium. In forty-eight hours, each cell of a colony seems to divide twice, and the colony doubles in volume. Had it been possible to keep all the cells which could have been produced during these sixteen years, their mass would be immense. A colony, originally one cubic millimetre in volume, would produce approximately one cubic centimetre of tissue in about twenty days. After sixty days, the volume of the tissues would be a little more than one cubic metre, and in less than one hundred days, one million cubic metres. It is obvious that tissues growing at this rate for sixteen years would reach a volume greater than that of the solar system.

2. Cell-proliferation is unlimited in time. Today, the rate of growth of the strain of fibroblasts is as great as it was fifteen years ago. The curve representing the variations of the growth velocity during this long period is parallel to the time axis. Time has no action whatever on these tissues. They are immortal.

This property also belongs to other tissues, as was shown by Fischer for iris epithelium, and by Ebeling for thyroid epithelium. Cultures of such tissues have been kept in full activity for several years in my laboratory. Normal and malignant cells of rats, mice, guinea pigs, and human beings were also discovered to be potentially immortal. Although the constituent cells of certain organs, such as the brain, lived *in vitro* only for a short period of time, animal tissues in general must be considered as capable of unlimited proliferation, in time as well as in space.

These facts are of profound significance. They demonstrate not only that tissue cells are endowed with potentialities far greater than they display within the body, but also that these potentialities become actual under definite conditions, *i.e.*, the elimination of certain metabolic products, and the presence of proper nitrogenous food.

It is obvious that the immense capacity for growth possessed by tissue cells must be kept under restraint while these cells live as parts of the organism. If the tissues of an adult animal suddenly were allowed to multiply freely, the body would grow in a rapid and disordered manner, and death would soon occur. Active proliferation of its constituent cells would at

once stop the functions of any gland. It is easy to imagine what would become of our memory and personality if the pyramidal cells started to multiply and to disturb the infinite complexity of the association fibres of the cerebral centres. Normal life and anarchical tissue growth are incompatible. The mechanism that causes tissues to be comparatively at rest when they live within the body becomes less obscure after some fundamental properties of these cells were discovered. We found that, if fibroblasts and epithelium are given certain nitrogenous substances, they are compelled to multiply. The substances endowed with the marvelous property of determining cell-proliferation are embryonic proteins, and polypeptides resulting from the digestion of a number of proteins. It is the concentration of such substances in the medium that regulates growth energy. On the contrary, cell multiplication is inhibited by blood-serum. This effect increases gradually with the age of the animal. The substances responsible for this phenomenon are lipoids, as was shown by Baker and myself. In the light of this new knowledge, it becomes entirely probable that the resting condition of adult tissues depends on the composition of the humours in which they are immersed. The cells are like a motor which stops when the fuel is exhausted, and starts again as soon as the combustible is replenished. When inert fibroblasts are extirpated from an old animal and cultivated *in vitro*, they do not display any growth energy. But as soon as they are given embryonic proteins, they multiply again. The factors that prevent tissue cells from manifesting their potentialities during normal life are chiefly a scanty food supply and an inhibiting medium.

The actualization of these potentialities takes place only under the influence of pathological processes, such as skin regeneration, bone-repair, or the growth of a cancer. If tissue cells were not potentially immortal, there would be no cancer. Also surgery would be impossible. Wound-healing and tumour-formation depend entirely on the capacity of adult cells to recuperate their embryonic proliferative activity. In the repair of a wound, leucocytes attracted to the site of injury manufacture directly or indirectly the substances that determine the multiplication of fibroblasts and epithelial cells. If they are prevented from coming, no cicatrization takes place. The growth of cancer is due to the special properties of malignant cells. These cells have the power, through the secretion of proteolytic ferments and acid formation, of producing substances which automatically compel them to multiply in an unlimited manner. In most of the cases, a resumption of cell activity within the adult organism must be attributed to the presence in the tissues of embryonic proteins or of polypeptides.

Although the body is composed of elements that are potentially immortal, it is, and will always be, subject to senility and death. Cells living as part of an organized community do not

find in such an environment the conditions required for immortality. The only living forms enjoying eternal youth are the colonies of unicellular organisms which eliminate their metabolic products directly into the outside world. When an animal is composed of a mass of cells organized as a closed system, the process of aging necessarily takes place. Immortality is incompatible with organization. But organization is necessary for the development of a highly differentiated nervous system and for the appearance of mental processes. Death is the price we have to pay for the possession of our brains. This price is not excessive, because the mysterious energy which is created by the cerebral cells, or expresses itself through them, is after all the greatest marvel of this universe.

In spite of the fact that higher animals will never reach immortality, there is some hope that the duration of their life may be artificially increased. The solution of this problem, as well as of the far more important one of improving the quality of living beings, rests on the future progress of cell-physiology and of the chemistry of nutrition. It is for this reason that I have considered it appropriate to lay before the members of this conference the results obtained by one of the most powerful methods created for the investigation of cell-functions. Through these experiments the immortality of animal tissues, and some of their fundamental properties, have been revealed to us. For the present, these findings are only of theoretical interest. But we know, as Claude Bernard has aptly said, that the knowledge of nature always leads to its mastery

tuberculous infection is its functional and not its organic relations. We have laboriously learned the same truth in our study of heart-disease, which is wonderfully similar to tuberculosis in its pathological economy; structural defects of the heart interfere but little with efficiency under conditions which do not overstrain compensation.

When tubercles are actively forming, or when a sufficient number of tubercle bacilli are breathing and feeding and disintegrating in the body, the poisoned host manifests the familiar signs and symptoms of active tuberculosis. We know from laboratory studies that different strains of human tubercle bacilli may vary enormously in their virulence or aggressive properties on inoculation. We know also that different species of animals inoculated from the same bacillary culture respond very differently in the extent and intensity of disease produced, or may not respond at all. Clinical evidence leads to the conclusion that both these factors, the virulence (and the quantity) of the bacilli introduced, and the specific resisting power, or immunity, of the host, are the vital factors in every case of human tuberculosis. With these facts in view, a consideration of the numerical factors involved in the problem makes it very probable that in human tuberculosis, by and large, we should be justified in expecting that the distribution of tuberculous infection should be included within the following three groups:

1. Here, the power of the bacillary invader (due to the number, the virulence, or the situation of the germs) is overwhelming as compared with the resistance of the host. This is a very small group with complete and speedy fatality.

2. A group which includes nearly all the cases we commonly recognize as "clinical tuberculosis." Here, the ratio, infection-resistance, is labile and variable, and is distinctly under the control of environment in its broadest sense, including behaviour. Inadequacy of environment has usually allowed extensive propagation of the disease antecedent to its discovery.

3. Our *a priori* classification would relegate to the third group the great majority of the subjects of tuberculous infection. Here the relative vital properties of soil and seed are mutually inhibitory; we may suspect that the struggle between the living bacilli and the equally living tissues results in a truce, wherein, *though there is destruction of neither, there is deterioration in both*.

The foregoing discussion has been elaborated as an interpretation of the writer's actual clinical studies. A huge proportion of our medical clientèle is distinguished by the lack of physical signs leading to specific diagnosis. Symptoms are negatively present, for the patient's lack of power is conspicuous by its absence, and the general practitioner is apt to satisfy himself with the word "neurasthenia." Of course, general nervous stability may be modified or undermined from many directions. Septic absorption from the tonsils or teeth, or elsewhere, may paint a picture duplicating any in our gallery. Hyperthyroidism and, more especially, hypothyroidism,

## THE EARLY DIAGNOSIS OF TUBERCULOSIS

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The title above is not at all synonymous with "The diagnosis of early tuberculosis." When we can make a diagnosis of tuberculosis recently acquired, having a clinical form which renders it obvious and important, the patient is likely to be already past help, as in the acute miliary disease.

One should recognize that latent or occult tuberculosis may form a background in many, if not most, constitutional disorders. For example, there seems to be some relation between tuberculous infection and endocrine disorders, particularly as they affect the thyroid gland. In this and similar fields definite search for evidence of tuberculosis should not be neglected; for the fact that there are no symptoms of clinical tuberculosis does not imply that latent foci of this disease may not be wielding constitutional effects which modify the vital reactions of the body, not to speak of the possibility of their acquiring activity under appropriate conditions.

The writer makes bold to lay down the proposition that the important practical aspect of

are often inextricable from tuberculosis as provokers of symptoms. Essential cardiac weakness on the one hand and adrenal insufficiency on the other play their parts as demons of exhaustion. Careful study of all such subjects is apt to lead to a suspicion of the existence of a complicating pulmonary tuberculosis; and no one should venture into this field of diagnosis to whom a hint is not, at least, as suggestive as a blow. With or without the exclusion of the above disorders, or as many more as erudition may suggest, our patient is miserable.

He, or usually she, if caught early, is in the second decade of life, is commonly thin, but at times overweight. Perhaps the blood pressure is the best single index of that vital tone whose abnormality points a diagnosis. Almost always hypotension is discovered, by which is meant systolic pressures ranging from 110 mm.Hg., downward. But much more significant, in the writer's opinion, is evidence of instability of the blood pressure, as may be gained by comparing the readings obtained in the two postures, recumbent-supine and standing-erect. Functional nerve-muscular weakness is evidenced on making this postural change, in the order named, by a drop in the maximal, or systolic, blood pressure and a rise in the minimal, or diastolic pressure, so that the intervening pulse pressure, which, broadly speaking, measures the irrigating efficiency of the blood current, is reduced to a value which jeopardizes the vital capacity of all tissues, but characteristically of the master-tissue, the brain.

But a still more delicate and habitual sign of vascular inefficiency is one which, strangely enough, seems to have wholly escaped general attention. This consists in wide fluctuations in the height of the maximal blood pressure. This does not refer to the so-called respiratory waves of the pressure-readings in which, roughly speaking, the highest pressure is found early in expiration and the lowest early in inspiration, but indicates waves which are much longer and deeper than the former. They possibly are genetically similar to the so-called "Traube's waves" accompanying asphyxia.

A more menacing sign of weakness is apparently an exaggeration of the foregoing phenomenon, in which the blood pressure readily drops, but imperfectly recovers, so that there is a continuous mean fall which may lead to fainting. I have not definitely attempted to trace the simultaneous variations in the diastolic blood pressure.

Much interest has recently been manifested in connection with the subject of the operative treatment of angina pectoris by removal of the superior cervical ganglion or other portions of the cervical sympathetic path. McCullough has given a good review of this subject.—*Am. Heart J.*, 1925, i, 370.

Space does not admit discussion of the complete physiological dyscrasias elicited by such results; suffice it to say that they apparently certify instability and weakness of the splanchnic vasomotor system, the most important bodily mechanism. Associated therewith is another muscular asthenia, that of the great band of muscular sheets within the abdominal wall. Relaxation of this supporting rampart induces viscerotonia and magnifies the vicious circle which envelopes the organism.

When there is a periodic afternoon rise in mouth temperature of one-half to one degree, increased after exercise, the evidence for tuberculous infection is strengthened; subnormal temperatures point in the same direction, if to a different phase.

Turning now to physical examination of the chest, the adept in tactile examination may have his suspicions excited by the intensity of the vocal fremitus, especially by its relative increase at the left apex. Practice in light percussion may reveal significant restrictions in the upper margins of apical resonance. But, in the writer's experience, auscultation of the voice and whisper is by far the most productive field of information as to the physical status of the thoracic respiratory apparatus. Nothing short of a treatise could comprehend the data on which that sentence is based. Every experienced examiner will grant that essentially identical physical signs in two different patients may mean, for one, encouraging improvement; for the other, alarming failure; so, in auscultation of a chest within the category of this article, the interpretation of essentially the same signs may vary with changes in the physical complex of the patient.

Finally, the study of the flat x-ray plate of the chest is indispensable as an objective aid to the diagnosis. Its interpretation needs the clinician as much as the clinician needs the plate. Suffice it to say that, in the class of cases which form the subject of this article, a radiological reading positive for tuberculosis should properly be made in many instances in which, without consideration of the whole story, the verdict would be definitely negative. This is that phase of disease concerning which the writer eight years ago thought himself distinctly original in characterizing "occult" tuberculosis, until, with mingled feelings, he found that the title had been used by Bayle more than a century and a quarter past.

S. L. Clark has made a microscopical study of the superior cervical ganglion which had been removed for the relief of this painful condition. He finds no specific tissue changes. The rationale of the benefit undoubtedly derived from the operation remains unexplained.—*J. of Lab. & Clin. Med.*, 1927, xiii, 101.

## Men and Books

### NOTES ON THE MEDICAL HISTORY OF KINGSTON\*

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#### Part I. The Early History of the Medical Faculty

After the war of the American revolution, most of the ten thousand refugees who came into Canada as "United Empire Loyalists" entered Lower Canada. Many of these remained in the Eastern townships of Quebec, but after the survey of the Ontario lands allotted for their settlement had been made, in 1783, the majority of this group moved westwards to begin life afresh in Upper Canada. During the war small groups of refugees had already crossed at Detroit, at Niagara, and at Carleton Island, near Kingston.

Just as it was after the conquest in 1759, so, after this later revolution, army and navy surgeons provided the chief medical services for the civil population about them.

In the eighteen-twenties various attempts were made to establish private schools to teach the art of medicine. One of the earliest of these took shape at St. Thomas, under the patronage of the famous Colonel Talbot. Dr. Charles Duncombe, a native of the United States, was the chief promoter of this school, which began operations in 1824. Prospective students were expected to be well up in Latin. Duncombe was to teach the Theory and Practice of Medicine, and John Rolph, then of Dundas, proposed to give lectures and demonstrations upon Anatomy and Physiology. Both these men were pioneers in all the educational developments of their time, and were equally in danger of being shot for their part in the rebellion of 1837. Duncombe escaped over the Michigan border, disguised as a woman, and did not return to Canada. Rolph established an important medical school in Toronto in 1843, after his return from banishment. He had already been in the habit of taking student apprentices from the time of his first coming to York in 1831.

In the Kingston paper of July 22, 1834, there appeared the following:—

"Kingston, Upper Canada, Medical Academy. Under the auspices and patronage of the Lieutenant-Governor, Sir John Colborne.

"Mr. Colls, Surgeon, Royal Navy, will open an establishment on August 1st. His terms are as follows: With board and lodging, washing, etc., £100 per year; without board, etc., £50.

"The gentlemen will be taught with great care the

duties incumbent upon them as professors of the general science, in every branch, theoretically and practically. Their morals will be carefully watched, and their religious duties will be impressively enforced upon them according to their tenets. They will be taught Anatomy, Surgery, Medicine, Midwifery, etc. Lectures will be daily given.

"Mr. Colls will teach the following languages, with which he is well acquainted: French, Spanish, Portuguese, Italian and Dutch. These will be gratuitous. £25 will be required in advance as an entrance fee, part of the annual payment. July 22, 1834."

Whether Mr. Colls met with suitable encouragement in this earliest known attempt in the Kingston district to teach medicine with a view to practice, I have not been able to discover. We know, however, that Dr. James Sampson and Dr. Adamson took apprentice pupils, who were later licensed in Toronto at the hands of the Board of Examiners appointed by the Lieutenant-Governor of Upper Canada. In April, 1838, for instance, one James Hope passed a very good examination before this Board, having been for four years a pupil of Drs. Adamson and Sampson\*.

#### THE ORIGIN OF THE MEDICAL FACULTY OF QUEEN'S

In the year 1890, when the late Dr. Fife Fowler resigned the Chair of Medicine, he gave the student body, in his valedictory address, the following account of the occasion of the establishment of the Medical Faculty affiliated with Queen's University:—

"I take this opportunity to advert to the establishment of the medical department of Queen's University, the more so as I alone remain of those who took part in its foundation forty-six years ago.

"It is very remarkable that the establishment of a medical school here in connection with the university was due to intolerable bigotry in the Queen City of the west. Certain students, whose names I will read you from the first calendar, were informed that they could not obtain the degree of doctor of medicine, unless they conformed to religious tests which were distasteful to them. These gentlemen petitioned us to establish a college in Kingston which would be open to all on the same terms. Their names were:—Daniel Chambers, Robert Douglass, Samuel Dunbar, Weston L. Herriman, William Hillier, John F. Mercer, William S. Scott, H. W. Spafford.

"A correspondence was opened up with these gentlemen by the late Dr. Stewart, and the result was the formation of the medical faculty of Queen's. The faculty consisted of Dr. Sampson, Dr. Stewart, Dr. J. R. Dickson, Dr. Horatio Yates, Dr. William Hayward, and myself." †

In an editorial in the "*Queen's College Journal*" of January 9, 1901, I find it stated that the appeal from these eight men came through a letter written by one of them, Robert Douglass, a B.A. of Queen's in 1851, to the late Mr. John Mowat, one of the first Trustees of Queen's College. This letter was written early in the year 1854. Mr. Mowat showed it to Dr. John Stewart, his family physician, who wrote to Douglass in reply. Dr.

\* Minutes of the Medical Board, quoted by Canniff.

† See "Kingston Medical Quarterly," October, 1900.

\*Read before the Academy of Medicine, Toronto, January 3, 1928.

Fowler's statement is further corroborated by the reported words of one of this Toronto group of eight, Weston L. Herriman by name. These we find in an address delivered by him in Convocation Hall of Queen's College on October 14, 1903, at the beginning of the fiftieth session of the medical school at Queen's:—



The late Dr. W. L. Herriman, of Lindsay, Ont., one of the first graduates, 1855.

"I have been asked why we left Toronto and came to Kingston to graduate, and have seen some statements in the papers about that which were a little off from the true version. I will answer for myself, and I think that will be an answer for the others in the main.

"For two years I attended lectures in the medical department of old King's College, which then became defunct by Act of Parliament and, I believe, mainly through the jealousy and rivalry of the late Dr. Rolph. He, no doubt, was an able man, not only in his profession, but as a political manipulator. He established a medical school in competition with the medical school of King's College University—that is what it was then called. There may have been some good reasons for his action. However, there was keen rivalry between the two schools.

"I have no doubt but Dr. Rolph and his few associates ground their pupils well and turned out good doctors. On account of the system of grinding we boys called his school the 'Pepper Mill'. Being forced to leave King's College, I went to Trinity College medical school and attended lectures one session. That being the end of three years of my studies I was allowed to be examined in certain subjects, and if I passed I would be done with them. I already understood that all prospective graduates of Trinity must subscribe to the 'thirty-nine articles' of the creed of the Church of England, but after passing the third year examinations I was told I could not graduate unless I was a 'bona fide' member of the Church of England, which I was not. I was born a Methodist, have lived a Methodist, and am likely to die a Methodist. So I and others had to seek shelter elsewhere. We came to Queen's and graduated without any religious test" \*

That these conditions actually were attached to the privilege of taking a medical degree from Trinity is very definitely established by the announcement published in the *Medical Chronicle* or the *Montreal Journal of Medicine and Surgery*, of 1853, Vol. I, page 188. This reads as follows with regard to the qualifications of candidates for degrees at Trinity:—

\* "Queen's Medical Quarterly," New Series, Vol. I, No. 1.

"Students are either occasional or academical. The first class are not required to submit to the test of the second, *viz.*, taking the oath of allegiance and supremacy, and declaring that they are members of the United Church of England and Ireland."

In Vol. IV, No. 7, of the *Medical Chronicle*, page 269, occurs a quotation from the *Hamilton Journal and Express*, taken from an article in that paper upon "Our Medical Schools". From this we learn that, during the session 1851-52, through the influence of Dr. Rolph and those who thought with him, the endowments of the medical school of King's College University were swept away by the Hincks Government, so that soon afterward the teaching of medicine at King's disappeared, leaving no trace, except that King's had still the power to grant degrees in medicine. The group of eight, therefore, must have been warned in good time that they would have to take refuge with the Trinity faculty. Naturally, the name of Rolph's School would be anathema to them on account of his part in the destruction of their medical Alma Mater. They must have felt perplexed indeed when faced with the contemporary state of medical affairs in Toronto. But a way out of the difficulty suggested itself to Robert Douglass, the graduate of Queen's in Arts, and a "man greatly beloved" according to the record\*.

The story, as given by Dr. Herriman, involves the following sequence of dates, if he took his first three years in medicine without interruption:—Sessions 1851-52, and 1852-53, at King's College University Medical School, Toronto, and session 1853-54 at Trinity. The date 1851-52 for the first session is confirmed by our knowledge of the fact that Robert Douglass graduated B.A. of Queen's in the spring of 1851. He would naturally enter upon medical studies the next session, 1851-52. The "Queen's Spirit," so frequently spoken of, and so easily appreciated still among any gathering of Queen's Alumni, may already have been strong in the soul of Douglass, and he may have felt and persuaded his companions to believe, that his indomitable Alma Mater would find for him and them some way of escape.

The secession of these eight students was not without an effect in helping to bring matters to a crisis at Trinity. The *Medical Chronicle* of September, 1853, page 158, records the fact that the Medical Faculty of Trinity had resigned their professorships. They had published in the daily press of western Canada a declaration that their medical graduates would no longer be subject to religious tests. The Council of their College, however, were still Tories of the die-hard type, and called upon these rebels to withdraw their announcement. This the Medical Faculty refused to do, so that the only course open to them was to resign.

The foregoing details provide the dramatic,

\* For references derived from the *Medical Chronicle* I am indebted to the courtesy of Dr. H. B. Anderson.

human interest side of the story, but for sober fact as to origins we must consult the unemotional statements in the Board of Trustees' Minute Book.

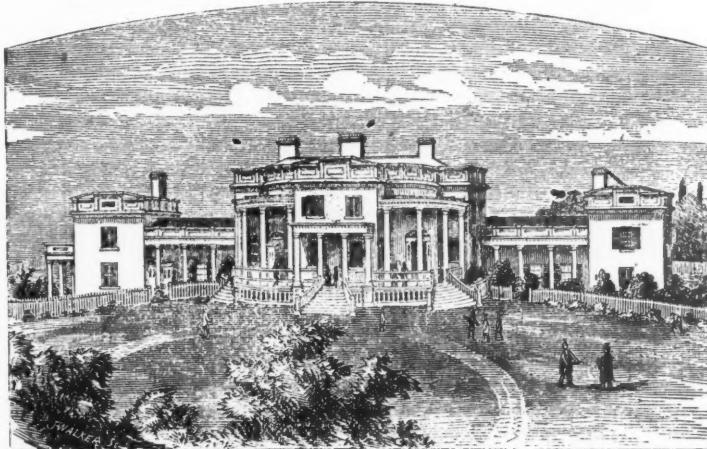
On the 20th of July, 1853, at the Annual Meeting of the Board of Trustees of Queen's College, it was resolved to establish, as soon as possible, faculties of Medicine and of Law.

In this year of 1853, expansion appears to have been in the air, for, in November, the Trustees purchased "Summerhill," the home of Archdeacon O'Kill Stuart, with six and a half acres of land, for £6,000, and a new appeal was made to the Presbyterian Church of eastern Canada for the financial support required to meet this outlay.

On February 7, 1854, a committee of the Trustees invited the medical practitioners of Kingston to meet in conference concerning the proposed establishment of a School of Medicine. The place of meeting was the home of the late Sir John A. Macdonald. This definite start may

list of names for various teaching appointments. The following is the first selection agreed to:—Dr. Sampson, President of Faculty; Dr. H. Yates, Professor of Medicine; Dr. Dickson, Professor of Surgery; Dr. Stewart, Professor of Anatomy; Dr. Meagher, Professor of Midwifery; Dr. Harvey, Professor of *Materia Medica*. Dr. Stewart was proposed as Secretary of the Faculty. A month later four of the leading doctors met the Trustees and made known their plan for the establishment of the school.

On August 2nd, the Executive Committee of the Board of Trustees recommended the appointment of lecturers in certain medical subjects "until circumstances should permit of the appointment of Professors." The lecturers were to be under the authority of the Executive Committee of the Trustee Board, and their emoluments were to be derived from students' fees and from the income of any grants which might in the future be given to Queen's by Government, or by private



UNIVERSITY OF QUEEN'S COLLEGE.  
"Summerhill" in 1856. Medicine for a few years occupied the two wings of the building.

have been due to the receipt of Robert Douglass' letter, early in that year, but the Board of Trustees' minutes make no reference to it.

An account of what transpired at this conference is extant in the handwriting of Dr. John R. Dickson, Sir John's physician. At the end are some lines written and signed by Sir John, confirming the accuracy of the minute. One of the statements so confirmed is to the effect that the conference of physicians was called at the instance of Dr. Dickson, and that Sir John—then, of course, Mr. John A. Macdonald—himself wrote an invitation to be present to every medical practitioner in Kingston.

An adjourned meeting, at which all the members of the medical profession were present, was held a fortnight later, with Dr. Sampson in the chair, and Dr. Stewart acting as Secretary. On this occasion, Dr. Stewart's was the only voice given against the establishment of a medical school. The meeting proceeded to propose a

donation, specifically for the uses of the medical faculty. Authority was given the lecturers to secure a building containing two lecture rooms and an anatomy room. The sum of fifty pounds was granted them to buy charts and apparatus; £250 was to be the limit of the financial obligations then assumed for all purposes.

The lecturers who first taught medicine tentatively in Kingston were:—Drs. Sampson, Stewart, Dickson, Horatio Yates, Hayward, and Litchfield. The Rev. Dr. Williamson, of the Arts faculty, gave lectures on chemistry.

There were twenty-three students in the first class, and nine graduated in the spring of 1855—the eight men of three years' standing in Toronto, and another, who had taken his preliminary studies in Toronto and in New York.

It was on June 20, 1855, after this fairly successful start, that it was finally resolved that a medical faculty be established in connection with Queen's College. The professorial staff then appointed

were:—Dr. James Sampson, President, and Professor of Clinical Medicine and Clinical Surgery; Dr. John Stewart, Professor of Anatomy, Physiology and Practical Anatomy; Dr. John R. Dickson, Professor of Principles and Practice of Surgery; Dr. Horatio Yates, Professor of the Principles and Practice of Medicine; Dr. Fife Fowler, Professor of *Materia Medica*; Dr. John P. Litchfield, Professor of Midwifery and of State and Forensic Medicine. They were asked to sign a statement of personal acceptance of the authority of the scriptures of the Old and New Testaments, and to give an undertaking that they would not do or say anything contrary to the doctrines contained in the same. Students were to be entirely free of religious test.

It is evident that from the first there was great fear on the part of some of the trustees that the college income might be seriously drawn upon by the new faculty. The Revs. Dr. Machar and Dr. George, and Mr. Malloch, dissented from the above resolution confirming the appointment of this first professorial group, and there was a movement to have a special deed drawn up to prevent the alienation of any capital funds of Queen's College for the use of the medical faculty.

Forty-seven students were in attendance during the second session; sixty-four in the third, and ninety-five in the fifth.

(*To be concluded*)

#### THE TWO HUNDREDTH ANNIVERSARY OF JOHN HUNTER \*

I make no apology in breaking in on your studies this morning for a few moments to ask you to meet and to do honour to the name of John Hunter. Two hundred years ago to-day he was born in a small farmhouse in West Kilbride near Glasgow, the tenth child of a small farmer. We know little of his early years, and less of his early education except that it was scanty. His brother William had gone to Glasgow University, and had, after a brilliant career, become an eminent doctor. William migrated south to London and there set up a medical school which had such success that soon William became recognized as the foremost teacher of medicine in the city. At the age of twenty John set forth to join his brother and to become his assistant and pupil. After three years' study John qualified as a surgeon. He remained on at the school after he qualified, and soon was engaged on a series of researches on comparative anatomy and physiology. He was not long in applying his results to his work as a surgeon. He raised surgery from the empiricism of the Barbers to become a craft inspired by the methods of true science, and a technical skill controlled by reason and understanding. If Harvey laid the foundations of a real science of medicine, John Hunter

can with equal truth be said to have accomplished a like service for surgery.

John Hunter was a pioneer and like all pioneers he lived and worked alone, for none of his contemporaries could think as he thought or see what he saw. Like Vesalius and Harvey he had to foster a new generation to understand his ideas and expound his thoughts. He was an anatomist but with an outlook on his subject which differed profoundly from that of the contemporary British and Continental schools. Anatomy had fallen under the spell of the French school of anatomists led by Winslow and others who had followed in the path of Vesalius, and had reduced anatomy to the form of a minute and accurate description of the structures of the human body. John Hunter broke away from this tradition unconsciously perhaps, but that we shall never know. He formulated the original Harvey ideal and followed it; the ideal that a structure has a story to tell of its function and its history. Hunter did not rest with the discovery of something but carried on until he had attempted to explain its functions. In this he was handicapped by the fact that he had little knowledge of chemistry, and the microscope had not come into use in the investigation of minute structures.

He was a biologist in every sense of the word and carried into his work the truly scientific point of view. At an early stage in his career in his brother's school he commenced to study the growth of the chick. He used the eggs of geese as they were larger than those of the common fowl. He attempted to follow the growth of the chick by opening a small window in the shell and watching the embryo. He kept the egg immersed in a bath of warm salt water and was very disappointed when all his experiments failed. It took another fifty years of work by many men to give a reason for this failure. Remember that it was only about this time that Lavoisier discovered oxygen or as he called it respirable air. Twenty years before Black had discovered carbon dioxide and the time was not yet ripe to realize the true nature of the production of carbon dioxide in the body. He was not discouraged by this failure but promptly commenced to collect a series of chicks at different ages so that he could study the changes that took place. By this he was led to investigate the peculiar arrangement of the feather tracts on the surface of the body of the bird. He wrote to his friend Jenner to find a blackbird's nest and to abstract from the nest at intervals of a few days an egg which he was to plunge into a flask of spirit and to send it to him. Jenner carried out these instructions although he must have been rather unhandy as in one of his letters Hunter says:—"I will send you one (a thermometer) but take care that those damned clumsy fingers do not break it also."

Not content with these experiments he thought he should try to make some observations on the growth of bone. He bought a litter of pigs and fed them with madder for a week, starved them of madder for another week, fed them again, and

\* Abstract of address to second year class in medicine, McGill University, by Prof. J. Beattie, Assistant Professor in Anatomy, February 14, 1928.

so on. He killed off a pig every week and macerated its bones. In this way he was able to determine the growth of the bone as the madder stained newly deposited bone and left the older bone unstained.

(After describing various other physiological experiments carried out by Hunter, Dr. Beattie went on to say):—

In his surgery we see traces of his experimental cast of mind, his work on the repair of fractures, his method of ligaturing arteries, and the working out of a collateral circulation, etc. But all the time during his practice he was experimenting. He records in one place:—

"In pursuing any subject, most things come to light by accident: that is, many things arise out of an investigation that were not at first conceived, and even misfortune in experiment has brought things to our knowledge that were not and evidently could not have been conceived. On the other hand, I have often devised experiments by the fireside and in my carriage, and conceived the result: but when I tried the experiment the result was different, or I found it could not be attended by all the circumstances that were suggested."

A statement which sums up the nature of research work, its disappointments, its fascination, its compulsion to go on doing things and testing explanations by new experiment.

Such was the persevering mind of John Hunter. He handed on his torch to men like Astley Cooper, Cline, Everard Hume, Blizzard, Dorsey and Physic. John Hunter profoundly influenced surgery in America. John Morgan and William Shippen, the founders of the first medical school in America, which has expanded into the Medical School of the University of Pennsylvania, were much influenced by him. Physic was almost as much the mouthpiece of the doctrines of John Hunter in America as was Abernethy in England. The best American surgery grew out of English surgery, with Hunter as its prophet. The first professor of surgery in Harvard was Collins Warren, the distinguished son of an eminent father, and the pupil of Astley Cooper, who was a pupil of John Hunter.

The Hunterian era awoke in the minds of men a desire to explore old ground by new methods, and to unearth truths so long concealed. There was a spirit of adventure like that which animated the Elizabethan explorers, the ambition of the human intellect to extend its range of opinion and knowledge. To Hunter belongs the credit of the New World in medicine. He it was who lighted the torch and handed it on to others who by their teaching and practice have spread his influence wherever modern surgery is to be found. I would ask you to remember that if Hunter with the knowledge and means at his command seems to us to-day to walk haltingly, or even often to have gone astray, shall not we seem to have done the same to those who read our story 200 years hence? It is one of the lessons of history that

each age steps on the shoulders of the ages that have gone before, and that the value of each generation is in great part a debt to its fore-runners.

#### DR. WILLIAM CAMPBELL VAN BUSKIRK

Among the many eminent members of the profession who have left their mark upon the localities in which they practised, was Dr. William Campbell Van Buskirk, ex-mayor of the City of St. Thomas, Ont., and at the time of his death its chief medical officer of health. For over half a century he practised his profession in that city and throughout his long and honourable career he was always recognized as one of its most public spirited citizens.

Dr. Van Buskirk was born in Yarmouth Township, Ontario, early in 1825. His father was a native of Nova Scotia. Shortly after his birth his family removed to the rapidly growing town of London, where his early years were passed. When sixteen years of age his family removed their residence to St. Thomas. Deciding upon entering the medical profession he commenced his studies in Toronto and graduated from the University in 1853. University affairs in Toronto at that date were very unsettled, so before entering upon practice he spent a year in post-graduate hospital work in New York, and afterwards visited the hospitals in London and Paris on returning to St. Thomas and commencing the practice of his profession he very quickly took a prominent part in the development and progress of that town, and was a strong advocate of all matters of public hygiene. He was devoted to his profession and used his advanced knowledge in the interest of his patients and of the public generally in preference to any personal aggrandisement. The question of a patient's ability to make financial remuneration for medical services never influenced his work in any way. It was sufficient for him that suffering humanity required his skill and knowledge. He endeared himself to hundreds of families by his unselfish and often unrewarded ministrations to the sick and needy, and many a kindly deed of his never saw the light of publicity. To further his strong views on the value of public hygiene, he served for a couple of years as alderman in the council, during which he strongly advocated a general sewerage system for the city and the removal of the water works pumping station to a point above the city, and the installation of an up to date filtration system. In 1881 he was elected Mayor, the first year in which the city was incorporated, and served two years. He afterwards became medical health officer, a position which he held with general satisfaction for over twenty-five years. Among his numerous other duties he acted for many years as assistant physician of the Railroad Hospital Association for the Thomas Williams Home, and was surgeon to the Elgin County Jail.

Dr. Van Buskirk, in addition to being devoted to his practice, was of an inventive turn of mind, and invented several articles of machinery. One of these was a ditching machine, a machine which, with a few improvements, is now in use all over the country.

He was married to Miss Annie Fraser, the sister of the first Presbyterian minister in the city and teacher of the first Grammar School. Dr. Van Buskirk lived to a good age. He was a

man of wonderfully strong physique, and fought off the encroachments of age until he had long passed the allotted span of life. Although in failing health during his latter years, he continued at his public duties as health officer until shortly before his death which took place December 10, 1910. His passing was regretted by scores of his fellow citizens who will long remember him for his many useful and kindly deeds.

### Association Notes

#### THE ANNUAL MEETING, CHARLOTTETOWN, P.E.I., JUNE 18TH TO 23RD

Every indication points to a good programme and a good attendance at our meeting in Charlottetown. To-date contributions to the programme are as follows:—

Dr. L. J. Austin, Kingston—The wasted hand.

Dr. Alan Brown, Toronto—Some common mistakes in diagnosis and therapy in diseases of children.

Dr. Alan Brown, Toronto—(Public Meeting)—Sunlight—its effect on growth and resistance of the child.

Sir Lenthal Cheatle, London, Eng.—(Subject not yet announced).

Dr. E. M. Eberts, Montreal—Carcinoma and ulcer of the stomach, with demonstration of wax models.

Dr. A. Grant Fleming, Montreal—Responsibilities and opportunities of the general practitioner in preventive medicine.

Dr. A. Grant Fleming, Montreal—(Public meeting)—The value of periodic health examinations.

Dr. John Fraser, Montreal—Cancer of the cervix uteri; the value of hysterectomy

The Hon. J. H. King, M.D.—(Public meeting)—Immigration.

Dr. G. H. Murphy, Halifax—The post-operative accident.

Dr. Helen MacMurchy, Ottawa—Maternal mortality.

Dr. Daniel Nicholson, Winnipeg—Asthma.

Dr. R. E. Powell, Montreal—Benign papilloma of the bladder.

Dr. R. D. Rudolf, Toronto—The use of sulphocyanate of soda in high blood pressure.

Dr. W. L. Robinson, Toronto (Subject not yet announced).

Dr. F. N. G. Starr, Toronto—Cancer of the stomach.

Dr. P. H. T. Thorlakson, Winnipeg—Primary ulcerative colitis.

Dr. Geo. L. Tobey, Jr., Boston—Consideration and treatment of chronic purulent otitis media.

Dr. A. F. VanWart, Fredericton—Types of encephalitis lethargica in New Brunswick.



Prince of Wales College, Charlottetown, where the meetings will be held.

versus radiation in early cancer of the cervix.

Dr. A. H. Gordon, Montreal—Some clinical aspects of hypothyroidism.

Dr. Duncan Graham, Toronto—The treatment of pernicious anaemia.

Dr. W. B. Hendry, Toronto—Heart disease and pregnancy.

#### THE PRINCE OF WALES COLLEGE

A century has almost passed since attention was first called in the legislature to the necessity of an institution for classical studies in the Island, and a bill was passed in the house in 1829 to further the establishment of such an academy in Charlottetown. It was not, however, until 1836 that an academy was opened and did much for the cause of higher education in the province. In 1860 the academy gave way to the Prince of Wales College, a provincial institution which occupies a high place among the institutions of its kind in Canada. The old wooden building in which the work was carried on was replaced in 1900 by a fine new brick structure, which in 1907 was further enlarged by a handsome addition, affording increased library facilities, and containing a large assembly hall, where the Canadian Medical Association meetings will be held, all of which was the gift of Sir William Macdonald, a native of Tracadie, and who was also so lavish in his

gifts to McGill University. Prince of Wales College does not grant degrees, but the holder of a third year diploma is admitted to second year arts in any university in Canada. Its principal at present is Dr. S. N. Robertson, M.A., LL.D., who has been at its head since 1901. Many distinguished islanders owe their success in great measure to the excellent training obtained in its classes. Two outstanding graduates were the late Sir Louis Davies, K.C.M.G., Chief Justice of the Supreme Court of Canada, and Dr. Jacob Sherman, first Gilchrist scholar, once President of Cornell University, and at the present time United States consul at Berlin.



The Charlottetown Golf Links, situated on the shore of the East river about a mile from the city, is a well kept course of nine holes with sufficiently interesting hazards of wood and stream for the ordinary golfer and a pleasing panorama of green fields and water in the distance. The course is at the present time being enlarged to eighteen holes, fourteen or fifteen of which will be ready next season.

#### THE ISLAND\*

Our meeting this year promises to be an event to be recorded among the memorable experiences of a lifetime. Prince Edward Island, discovered in 1534 by Jacques Cartier, is rich in historic incident. It was first settled in 1663 by Acadians from the neighbouring colonies of Nova Scotia and New Brunswick. Later on, came shiploads of English, Scotch and Irish settlers, each group settling in a particular locality. To-day descendants of these pioneers are still grouped in their original home sites, with the inherited habits, customs and belongings of their forefathers. There still remain also on the Island picturesque encampments of Micmac Indians, and flint arrow heads and other warlike reliques are occasionally picked up in the vicinity of old camping grounds. Legend has it that Captain Kidd's pirate ship made the gulf one of its filibustering resorts, and put into the many havens of the Island for shelter. Although so small in area, only slightly more than 2,000 square miles, the Island has a shore line of over

1,000 miles. In two places the converging waters are only a few miles apart, thus nearly dividing the province into three parts. No part of it is far from tide water, and from every direction is borne the ozone-laden breath of the sea. The whole north shore of the Island for a distance



Dominion Experimental Fox Farm at Summerside.

of over ninety miles is a continuous series of fine white sand beaches beaten hard by the constant pounding of the surf. During the summer months all tidal rivers are inhabited by vast numbers of brook trout, varying in weight from one-half to three pounds. Deep sea fishing, motor boating, and yachting are sports which can be enjoyed to one's heart's content.

The arable land comprises about a million acres. Grain, potatoes and other vegetables, small fruits and seeds are grown abundantly. Farmers start working the land about May 10th, and the last crops are harvested by the first week in November. With the field crops are combined dairying, poultry raising and fur farming. The whole Island is a disease-free cattle



Montague Falls, Prince Edward Island

area, and dairy products are consequently in great demand. In 1827, 90 per cent of the butter and 90 per cent of the cheese was graded No. 1.

\* Abstract of a paper written by the Hon. Mr. Justice Arsenault.

Pioneers in the breeding of silver foxes, Prince Edward Island leads the world in quality and production per capita. There are upwards of 600 fox ranches on the Island, and thousands of high priced pelts and animals are shipped annually to central markets and to stock ranches elsewhere. Another enterprise which has met with remarkable success in recent years is the growing of certified seed potatoes. The success of these two industries alone has meant worldwide fame for the province.

The inhabitants have a right to boast of their climate. Winters are bracing, but not unusually severe. The spring is the most unpleasant season owing to the presence of ice in the neighbourhood of the shore. It is, however, the prelude to the beauty and brightness of the glorious Island summer. Fogs are unknown. The tem-

perature varies from 64 to 80 degrees F. The land lies steeped in sunshine and is fragrant with blossoms.

There are few towns or villages on the Island which lack features making a visit desirable. Charlottetown, the provincial capital, dates back to the years when the first French settlers chose it for their early fortifications because of its fine harbour and commanding location. It is one of the oldest provincial or state capitals in America. Summerside is the second town in size and importance, and is a convenient centre from which to visit the surrounding country. Souris at the other end of the Island is much favoured by tourists from the upper provinces and the United States. Georgetown, Montague, Alberton and Tignish have each a charm peculiarly their own.

## Provincial and Local Association Notes

### ONTARIO MEDICAL ASSOCIATION MEETING, KINGSTON, MAY 30th TO JUNE 1st

The various committees have been meeting regularly and an interesting programme is now assured.

A provisional scientific programme is appended.

Particular attention is drawn to the film of a growing tumour showing the influence of radium upon cell-multiplication, which is being kindly lent by Dr. R. G. Canti of London, England. Those who were present at the British Medical Association meeting in Edinburgh, in July of last year, will agree that no more striking thing of the kind has been produced. It is an exhibit which it is well worth going far to see.

An attractive series of entertainments and excursions is being arranged. Amongst these are, a boat trip to the Thousand Islands; a Military Tournament at the Royal Military College, by the kind permission of Colonel Constantine; and a Garden Party at Rockwood Hospital, on the invitation of Dr. Edward Ryan. Special arrangements have been made with the Golf Club, and many motor cars have been promised by the citizens for tours to points of interest in the neighbourhood.

On Tuesday evening there is to be a Round Table Conference, held under the auspices of the Committee on Interrelations; on Wednesday, the Annual Dinner and Ball at the recently completed Hotel La Salle; and on Thursday the various Alumni dinners will take place.

#### PROVISIONAL SCIENTIFIC PROGRAMME

*Wednesday, May 30, 1928*

- Dr. W. R. Jaffrey, Hamilton, Dermatitis venenata.
- Dr. N. B. Gwyn, Toronto, Coronary thrombosis.
- Dr. J. C. S. Battley, London, Carbon monoxide poisoning, especially its late effects.
- Dr. Geo. Hooper, Ottawa, Procidentia uteri.
- Dr. J. K. MacGregor, Hamilton, Atypical goitres.
- Dr. S. K. Evans, Ottawa, Investigation and surgical treatment of goitre.
- Dr. Thomas Cullen, Baltimore, Address in Gynaecology.

*Tuesday, May 31st*

- Dr. Dobson, Peterboro, Newer tests of gastric function.
- Dr. G. C. Hale, London, Arterial hypertension.
- Dr. S. M. Asselstine, Windsor, Pernicious anaemia.
- Dr. E. S. Mills, Montreal, Pernicious anaemia and its dietetic treatment.
- Dr. G. H. Stobie, Belleville, Intestinal obstruction.
- Dr. T. L. Gray, St. Thomas, Problems in x-ray diagnosis.
- Dr. B. B. Vincent Lyon, Philadelphia, Address in Medicine, "Uses of the duodenal tube in diagnosis and treatment."

*Friday, June 1st*

- Dr. Tew, London, Normal obstetrics.
- Dr. D. T. Smith, Ottawa, Surgical shock.
- Dr. E. E. Cleaver, Toronto, Idiopathic colitis.
- Dr. H. Little, London, Chronic intestinal indigestion.
- A Symposium on Subacute and Chronic Forms of Nephritis.
- Programme being arranged by Dr. Duncan Graham, Toronto.
- Dr. J. G. Dwyer, New York City, Address; the title to be arranged later.
- Dr. James Wallace, Travelling Secretary, American Public Health Association, and formerly Epidemiologist, State Board of Health, Iowa, has accepted an invitation to be present, but has not yet forwarded the title of his paper.

Invitations to open the discussion on various papers have been sent to a number of physicians, and acceptances are now coming to hand, so that we are assured of a discussion of each paper.

Dr. R. G. Canti, of London, England, has consented to forward for our meeting his cinema film, illustrating the growth of tumours *in vitro*, and the effects of radium on the cells.

W. T. CONNELL  
*Chairman, Programme Committee*

#### PROPOSED ENACTMENT AFFECTING PROFESSION IN ALBERTA

The following brief résumé of the proposed enactment affecting the medical profession in this province has been handed to us for publication in the *Journal*.

The Government of Alberta proposes to introduce and pass at this session of the Legislature the Professions Discipline Bill, which in the name means more than what is contemplated by the Government, as indicated to the members of the Council in an interview on February 17th.

It would appear that the Board to be set up, will be composed of five members, one a judge of the Supreme Court of Alberta, and the other four prominent outstanding laymen, whose

ability, fairness, and general good judgment will mark them as fitted for the position.

This Board will replace the Supreme Court as far as all appeals of a disciplinary nature are concerned. No matter will be considered or dealt with by the Board until reference has been made to the benchers of the Law Society, in case of a lawyer, or the Council of the College of Physicians and Surgeons, in the case of a doctor, or other similar bodies of the other professions, and then only in case the disciplining body has failed to act or having acted the decision is appealed against by the complainant or by the defendant.

The Board will have no investigating or disciplinary powers not conferred on the profession or the Executive of the profession, whose member's case is under review. In order to make the Board effective with power, revised Acts are to be passed giving the professions additional powers themselves, so that their acts will be in accord with the new act now being introduced.

None of the rights of a professional man to sue for the collection of his account, nor of a patient or client to sue for damages as at present existing will be interfered with. The Board will deal with questions of discipline and these only.

### Reports of Societies

#### OUT-PATIENT MEDICAL STAFF OF THE TORONTO GENERAL HOSPITAL

*Hyperthyroidism, Myocardial Degeneration, Encephalitis*

The meeting of the Out-Patient Medical Staff of the Toronto General Hospital took place on the evening of January 18th.

Dr. W. R. Caven presented the case of a girl aged 19, who had come to the medical clinic 18 months before, with the history of enlargement of the neck, of nervousness, and of blurred vision with dizziness. There was in addition the detail that at two years of age she had developed quite suddenly complete paralysis of the whole left side, for which no very evident cause had ever been found. There had been a very marked increase of weight in recent years, and on this account pituitary disease had been suggested. A year later than this the suggestion of endocrine disturbance had been made and the patient took thyroid extract for nearly a month. She felt much worse after it, so far as her nervousness was concerned. The thyroid extract was discontinued, and, as she was found to have a basal metabolic rate of 144 per cent, she was taken into the ward for partial thyroidectomy. It was stated that somewhat less than the usual

amount of tissue was removed. The histological report was that of diffuse hyperplastic goitre. Apparently one had to look at the operative results in this case as distinctly unsatisfactory, for the girl remained nervous and depressed, with a basal metabolic rate of 143 per cent. Dr. Caven remarked that her general condition must also be considered as unsatisfactory, and that, with the marked obesity, with the high basal metabolic rate and enlargement of the thyroid, one must consider the case as something departing very materially from the usual run of thyroid cases. The obesity and the lethargy, the latter a very distinct complaint, plus an appearance highly suggestive of myxedema suggested much more a polyglandular syndrome, and there had always been marked menstrual irregularity. It should be noted, however, he said, that there had always been a little steady fever, between 99° and 100°, and that the pulse rate was always distinctly increased. One further point he wished to bring before the meeting was that there was a large telangiectatic area on the right arm. This might have some bearing, he thought, on the origin of the paralysis of the left side, as there are many cases of cerebral telangiectasis with histories very similar, and in which a diagnosis has been suggested by the presence of the

telangiectases elsewhere on the body. Dr. Caven concluded by proposing for discussion the following questions:—

1. Has the telangiectasis on the arm any bearing on the upper neuron paralysis? *i.e.*, is this a case of paralysis due to cerebral telangiectasis of the type described by Spiller?; or is it an infantile hemiplegia of infectious origin?

2. Is there a polyglandular syndrome accounting for the marked obesity, the menstrual irregularity, the mental dullness, and the absence of improvement after thyroideectomy?

3. Why should the metabolism rate still be elevated to the same degree after the operation as before, and should a further operation be done?

In the discussion which followed, Professor Graham suggested that since we had so much evidence of the incompleteness of the surgical procedure, that the case should be sent in for another operation, and pointed out that with rapid pulse, slight temperature, elevated basal metabolism rate, and enlarged thyroid, the case had many of the distinctive features of hyperthyroidism. It was difficult to speak on the other matter; the relation of telangiectasia to the brain lesion could only be conjectured. Without doubt there was much to suggest a polyglandular syndrome.

Dr. Gwyn showed the heart and aorta of a man, aged 42, who up to six weeks before his death had seemed in a reasonable state of health, save that he had noted slight shortness of breath on exertion. Without any history of a severe cardiac attack, he had noted that from a certain day any exertion, any exposure to cold, would be followed immediately by breast pain, sub-sternal in situation and radiating down the ulnar side of both arms. Cessation of effort usually relieved the pain, but on every day since the beginning of his complaint there had been this anginal symptom to a greater or lesser degree. The diagnosis of angina, myocardial degeneration, and aortitis had been made. There had been no distinct history of rheumatism, and syphilis seemed excluded by a negative Wassermann test. The bilateral distribution of the pain, and the suggestive evidence of an enlargement of the aorta, as shown both by percussion and x-ray, seemed to make necessary the addition of "aortitis" to the diagnostic labels. The patient improved quickly after seventy-two hours of rest and iodides, but on his re-appearance, four days after his first visit, it was noted by Dr. Stock that the pulse rate had risen from 70 to 120 and that the patient seemed weak and breathless. The man died suddenly and quietly in his sleep two days later. Careful enquiry revealed the fact that at no time in his illness had

he ever complained of an angina which could be called terrific in degree. The aorta showed an enormous atheromatous ulcer in the under portion of the arch, and, according to Dr. Klotz, there was evidence of a considerable degree of inflammatory change about it. Both coronary arteries were very thickened, the left standing out like a white quill, and stiff enough to vibrate when stimulated with a knife point. Inside the mouth of the left coronary was a fresh thrombus, completely blocking the vessel. The lower half of the left ventricle was a splendid example of the condition spoken of as myomalacia cordis. It was thinned and whitened, and perhaps represented the remains of the accident (acute coronary occlusion?) that took place at the beginning of his illness. Above the lower whitened area was a fresher extensive red softening, evidently a more recent infarct, and the vessel below was blocked by an old thrombus, which would suggest that the heart had carried on in a much impaired manner after two infarctions, and that death had been the result of the final blocking of the left coronary. There was no sign of pericarditis, nor had a rub been heard; there were no thrombi in the interior of the left ventricle. The orthodiagram had shown little or no enlargement of the heart. The electrocardiogram had shown evidence of grave disturbance of the heart-muscle action, as well as some interference with the conduction paths. It did not conform, however, to the picture often described as typical of coronary infarct.

Dr. Thompson presented a patient whose main complaint was numbness of the left side of the tongue, a hesitating speech, and weakness. He said that he presented this case in hopes of getting some information as to the length of time that might elapse before the late results of an encephalitis might be in evidence. The patient, a woman aged 49, entered the clinic complaining of weak spells, of numbness of the left side of the tongue, and stated that her friends had noted that her speech was monotonous, and that her facial expression was changing. This had been a development more particularly of the last few months, though she realized that she had felt weak and exhausted for several years without there being, however, any very positive impairment of any function. In her history, the doctor stated, was the detail that ten years ago, without warning or, as far as she knows, any preliminary illness, the left hand and left side of the tongue had become very numb. It was evident, however, as Dr. Thompson pointed out, that there must have been something more than this slight disability, because at that time she was in bed for six weeks, as she found great difficulty in walking, and there was apparently some spasm or weakness

of the muscles of her legs, because her feet had turned in on walking. This may have represented the onset of encephalitis, and it is quite evident from the history that there was a fairly diffuse affection of the nervous structures. The present state of affairs might represent, he said, the late results of the attack ten years ago. The facial expression, and the slow monotonous speech suggested very distinctly the picture of paralysis agitans, yet there was no tremor of the hands, and nothing in the gait to support this suggestion, and after ten years one would certainly expect to see much more evidence of progression than was now apparent. Nothing had been found to confirm the suspicion of syphilis, nor had one been able to associate the present condition with such affections as multiple sclerosis or diffuse changes in the cerebral arteries. On account of the rapid gain of weight, and undue susceptibility to cold, it had seemed wise to consider the possibility of a hypothyroid state, since this state, particularly in children, may be associated with distinct signs in the nervous system, but it had been found that the basal metabolic rate was high rather than low, 101 per cent. Blood-pressure was of normal range, and the urine of good specific gravity. The Wassermann reaction with both blood and spinal fluid was negative. As the patient stood before one, Dr. Thompson demonstrated the Parkinsonian appearance, and the fact that the tongue protruded rather to the left; the curious monotony of her speech was readily noted, but so far as could be made out there were no other signs of nervous involvement.

In the discussion which followed, it was pointed out that although at first sight it seemed as if these late results had only been appearing in the last few months, yet that the history of continued weakness, and the evidence of general apathy, indicated very suggestively that the present state of affairs was in great measure a continuation of the illness referred to as having happened ten years ago. It was, however, distinctly unusual for the Parkinsonian manifestations of encephalitis to be so long in appearing; it was stated that these usually followed quickly the evidence of a primary infection. The curious mask-like expression, after all, was generally considered as belonging to two conditions, paralysis agitans and encephalitis; the slight bulbar symptoms now remaining, while possibly suggestive of the Parkinsonian complex, were not associated with much evidence of progression. It would seem, therefore, that an encephalitis with these after-effects would explain the present condition of the patient.

N. B. GWYN

#### THE MONTREAL MEDICO-CHIRURGICAL SOCIETY

*Phlegmonous Gastritis, Tuberculous Meningitis, Coronary Thrombosis, intracranial haemorrhage, Carcinoma of the Rectum*

A regular meeting of this society took place on January 20th, Prof. L. J. Rhea in the chair.

Dr. J. E. Pritchard gave a pathological demonstration, with pictures, in the case of a woman, aged thirty-three years, who died of phlegmonous gastritis twenty days after confinement. Her illness set in on the tenth day after delivery, with chills and pain in the abdomen. The autopsy showed phlegmonous gastritis and generalized peritonitis. In the discussion that followed Dr. England raised the question as to why phlegmonous inflammation was so often localized in the stomach or in one of its layers. In this case the process was most marked in the submucosa. Dr. Scrimger referred to certain experiments which had been made by the injection of dyes into both submucosa and subserosa, which seemed to show that there was no connection between the two. Dr. Rhea suggested that the inflammation followed the line of the least resistance and might have some dependence on the state of tension in the muscular fibres.

Dr. H. P. Wright reported an unusual case of tuberculous meningitis (see pag 305). Here there had been a dramatic onset with a convolution. The diagnosis lay between tuberculous meningitis and encephalitis lethargica, but, owing to the absence of clinical and laboratory data until three or four days before death, it had been impossible to come to a definite conclusion until late. Discussing this case, Dr. F. G. Finley pointed out that irritability is sometimes very marked in the early stages of meningitis, and he had not infrequently been led to suspect the presence of this disease, when there was little else to go upon. He also referred to cases in which the fluid obtained from lumbar puncture was deceptive. Probably, the explanation was that the infection had not reached the spinal fluid. Further remarks were made on the subject of prognosis. Dr. Wright stated that the experience at the Memorial Hospital for Children was that cases positively shown to be tuberculous by the usual tests did not recover. Dr. Rhea referred to an epidemic of which he had knowledge, in which the diagnosis of tuberculous meningitis seemed proper but, in which twenty-three cases recovered.

Drs. D. Grant Campbell and Pritchard gave the history of an interesting case of coronary thrombosis, with the exhibition of post mortem material, in which the electrocardiograph failed to show anything unusual. Dr. Campbell Howard had seen another such case and referred to a remarkable case under the care of Dr. A. H. Gordon in which a lymphosarcoma was attached to the bundle of His, and which showed

a normal electrocardiographic tracing. In Dr. Campbell's case there had been a pericardial friction rub for the short space of three hours. In answer to a question, Dr. Campbell stated that pericardial friction will occur almost immediately after thrombosis. Pain is not invariably associated with coronary thrombosis.

Dr. C. C. Birchard, also, reported very fully a typical case of coronary thrombosis which will appear next month in the *Journal*.

Dr. F. A. C. Scrimger presented a paper on "Carcinoma of the rectum," in which he gave a résumé of the subject from its surgical aspect, with particular reference to the types of operative procedures, the possibility of cure, and the principles underlying the surgical procedures which are in vogue at the present time. The paper was based largely upon material obtained from 116 cases in the practice of the Royal Victoria Hospital. In the discussion Dr. Howard brought up the subject of the diagnostic value of the barium enema. Dr. Scrimger placed no reliance on a negative showing, but felt that some reliance could be placed on a positive one. Dr. H. P. Wright asked if carcinoma of the rectum was more common than it used to be, and if there was any relationship, cause and effect, between the common use of liquid paraffin as a laxative and malignant growths in this situation. Dr. Scrimger thought that carcinoma of the rectum was probably more common, but discounted the influence of paraffin. Dr. Rhea felt that paraffin preparations, as irritants, were hardly in the same class with tar, which has been used so much of late in connection with the production of experimental cancer. Dr. Howard asked for Dr. Scrimger's opinion as to the value of the proctoscope in the diagnosis of rectal cancer. Dr. Scrimger did not think that the proctoscope, as a rule, gave any more information than could be obtained by the examining finger.

*Intracranial Haemorrhage in Infants, Septicæmia in a Case of Diabetes, A case of Chronic Nephritis, Hypothyroidism*

A meeting of the Montreal Medico-Chirurgical Society was held on February 3rd. A pathological demonstration was given by Dr. W. H. Chase on several cases of intracranial haemorrhage in stillborn and newly born babies, with special reference to evidences of trauma to the tentorium cerebelli. In autopsies on 71 children in these groups, there were 21 instances of intracranial haemorrhage.

Drs. E. H. Mason and W. W. Beattie reported on a case of septicæmia due to a member of the *mucosus capsulatus* group (Friedländer's bacillus) in a patient affected by diabetes mellitus. The course was rapid, and there was no localization of the infection. The diagnosis was made by means of blood cultures. There were no marked evidences of arteriosclerosis.

The symptoms of diabetes had been present for sixteen years. In the discussion that followed, Dr. Rabinowitch remarked that this was the first authentic case reported of diabetes without arteriosclerosis. Personally, he had never seen one before. He asked what other steps had been taken to establish the diagnosis of diabetes besides the demonstration of glycosuria and glycaemia. Dr. Mason, in reply, stated that the man, who was fifty-five years of age, came under observation first in 1921, when he gave a history of symptoms of frequency, loss of weight, and glycosuria for nine years. Since then he had followed a diet. He had been seen on many occasions since 1921, and was practically free from sugar until he developed the present infection. Then, he presented haematuria and glycosuria. The infection, therefore, caused an aggravation of his diabetic condition, if it was right to call his condition diabetic. The vessels at his wrists were not calcified, but no attempt was made to determine whether other vessels were calcified. Arteriosclerosis could, therefore, not be absolutely excluded.

Dr. W. deM. Scriver reported on a case of severe chronic nephritis with hypertension, acidosis, albuminurie retinitis, and convulsions, in a woman eight months pregnant. She had had seventeen full-term pregnancies, resulting in live children, and four miscarriages. She was delivered of a dead foetus. Since this time the retinitis had healed, but the impaired function of the kidneys persisted.

The paper of the evening was read by Dr. A. H. Gordon on "Some clinical aspects of hypothyroidism." The state of diminished thyroid activity presents clinical resemblances to various other morbid states, such as pernicious anaemia, chronic nephritis, involution melancholia, pericarditis with effusion, secondary anaemia and migraine. The discussion which followed brought out the point that it was easy to overlook cases of hypothyroidism, and that alienists should be careful in diagnosing a depressive psychosis without thoroughly investigating the physiological condition, notably the function of the thyroid gland. Dr. Mason pointed out that myxoedema patients were frequently found with a basal metabolism 20 to 25 per cent below normal, but there were also adults, without signs of myxoedema, who gave the same figures. He asked Dr. Gordon if he thought there was any relationship between the low metabolism of adolescent goitre and that of the myxoedema of later life. He pointed out the danger, in some cases, of bringing up the basal metabolism by therapeutic measures to the normal standard, where the condition had been of long-standing. It had been his experience to lose a case from angina and heart failure under such medication, where the metabolic rate was 15 per cent below normal. The heart becomes adjusted to a lower level, and is unable to live up to a normal metabolism.

Dr. Rabinowitch emphasized some of the important points that Dr. Gordon had brought out. Every patient with a low basal rate is not a hypothyroid case. In a series of three thousand basal rate estimations there were found from one hundred to three hundred patients with somewhat low basal rates. He never relied upon a basal rate done for the first time. Where a large number of people are given thyroid extract there are some in whom it does not raise the basal rate, though they may develop other symptoms. It is important to remember that there is something in thyroid extract which has other effects than that of raising the basal metabolic rate.

In reply Dr. Gordon agreed with Dr. Mason and Dr. Rabinowitch, and felt that a diagnosis of hypothyroidism should not be based alone on a low basal rate, but that there should be one or more of the usual clinical signs. He thought there was much to support the idea that myxedema in later life might be the result of adolescent goitre. He also agreed that there was danger in putting extra stress, in cases of hypothyroidism, upon a damaged or inadequate heart.

#### THE STUDY OF TUBERCULOSIS AMONG THE INDIAN BANDS OF BRITISH COLUMBIA

This important field work was originated by a committee of the Canadian Tuberculosis Association; the Association interested the Honourable Charles Stewart, the Superintendent General of Indian Affairs, in the work, and he obtained from Parliament sufficient appropriation to provide for a thorough investigation. The Deputy Superintendent-General of Indian Affairs, Dr. Duncan C. Scott, was of the opinion that the Department should have the advantage of outside expert medical opinion as to actual conditions, and as to any practical suggestions for the provision of medical organizations and treatment equipment, which, if provided by the Department, would be economical and acceptable to the Indians and promise an abatement of the disease. The Committee is composed of Drs. Pagé, Carmichael, Fitzgerald, Hill and Wodehouse. Two years' work has been carried out in British Columbia, and reports have been completed under the direction of Prof. H. W. Hill, of the University Committee of that province, with Dr. C. H. Vrooman collaborating in diagnosis.

"On the two investigations (by a coast party, 1926; and by an interior party, 1927) there were seen and examined, in seven Indian agencies (Kwakwakwala, Bella Coola, Nass, Babine, Stuart Lake, Kamloops and Okanagan), a total of 1,871 Indians in a total of 39 communities; about two-thirds (1,248) of the Indians seen were examined physically and all but 157 of this number also by x-ray. Epidemiological studies were also made in regard to 1,871 Indians, amounting to 9 per

cent of the total of the British Columbia Indians. At the same time examinations were made for the presence of goitre and trachoma. The former is present only where salt-water salmon are lacking for food; the latter was not detected in acute form, and is not a factor in the morbidity of the Indians examined."

The report submitted by Dr. Hill for the work of 1927, concludes as follows:—"The evidence collected in this investigation was rather expected to yield conclusions regarding the interior Indians differing in degree, perhaps in kind, from those already offered concerning the coast Indians. But despite the differences in climate, occupation, history, race, etc., shown by the four groups studied (Coast Agencies, Babine Agency, Stuart Lake Agency, and the Dry Belt Agencies, namely, Okanagan and Kamloops) none of these differences, however striking, have been found to yield corresponding differences in the incidence or outcome of human tuberculosis. Nevertheless, certain other physical troubles have shown differences corresponding with these groups. Goitre is prevalent amongst the members of one group only—that of the dry belt). The present activity of bovine tuberculosis, as implied by the presence of active glandular tuberculosis, shows itself chiefly in three groups, *i.e.*, in all excepting the coast group; furthermore, a high percentage of eyes defective from disease is found in all but the coast group, which shows a relatively very low percentage. From these troubles the interior suffers, while the coast largely escapes. If to differences in "general conditions" can properly be ascribed such differences in the above named afflictions, it might be expected that the differences in "general conditions" would show some parallel difference in the morbidity from tuberculosis. But the coast Indians show in tuberculosis (other than bovine) quite the same incidence (within an inevitable working error) as do the interior Indians. Obviously then, the practical absence amongst the coast Indians of goitre, of bovine tuberculosis and of diseased eyes, has no detectable influence, either good or bad, upon the morbidity from pulmonary tuberculosis. It evidently follows that the conditions which are back of this coast situation, tending to eliminate the diseases above named, cannot be conditions that eliminate pulmonary tuberculosis; and conversely, since pulmonary tuberculosis is no more common in the interior, where goitre, bovine tuberculosis, and bad eyes appear to flourish, it cannot be said that the conditions which precipitate these last named diseases enhance in any way the prevalence of the former.

It is quite true that no one now ascribes goitre to "general conditions." The specific condition—absence of iodine—is too well understood to leave "general conditions" any weight. Nor is bovine tuberculosis any less clearly seen to be not due to "general conditions," but to a specific condition, *i.e.*, the presence of bovine tuberculosis bacilli in those cows supplying the human population with raw milk. True, the conditions be-

hind the great variety of defective eyes found are as yet obscure. But, it should not be expected that "general conditions" should have weight in pulmonary tuberculosis, since in every disease that is really well understood, it is always specific, not general, conditions that act.

These specific conditions for tuberculosis exist in the interior exactly as they do on the coast—(a) the prevalence of foci of infection, *i.e.*, open tuberculosis in the human subject; (b) the presence of every opportunity for the spread of the tubercle bacillus from these infected persons to new persons; (c) susceptibility to the infection amongst the latter. Intimacy of intermingling of the infected with the uninfected exists both on the coast and in the interior to a relatively enormous extent, and to this enormous exposure is obviously due the relatively enormous incidence.

#### GENERAL CONCLUSIONS

Both on the coast and in the interior, pulmonary tuberculosis exists in about the same total incidence, and with practically the same age incidence. This is true despite contrasts in climate, wealth, diet, nutrition, occupation, race and the incidence of other diseases. The only factor common throughout is that of exposure to infection; and this is almost as extreme as it can be, under the circumstances, in all groups examined.

#### DISCUSSION OF REMEDIAL MEASURES

The above conclusions compel the repetition here for the interior Indians of those remedial measures discussed last year for the coast Indians:—briefly, the finding of the open cases; their segregation; and the supervision of those non-open cases already infected from them.\*

This means that the staff of tuberculosis experts and nurses proposed for the coast Indians should be sufficiently expanded, to make similar investigations and give similar supervision in the interior. It means also that the segregation facilities proposed should be expanded from those sufficient for the coast, to those sufficient to take care also of the interior—a similarly infected people of about the same population, a people not only as numerous, but much more scattered over a much more difficult country. The nomad Indians (estimated at 2,500) are not included here. (For population figures, see; First Report, Appendix, and this Report, Appendix, Table 15).

There can be no difference of opinion concerning the need thus outlined in both Reports for an inspection, house to house, village by village,

\* The existence in the interior, where raw cow's milk is used to some extent, of glandular, especially of cervical glandular tuberculosis, points to the need of tuberculin testing of the cows used for this supply. Much more simple, direct and inexpensive would be the introduction of pasteurization, or even simple boiling, of the milk as a routine precaution. One or other of these measures, preferably boiling or pasteurizing, should certainly go into effect in all Indian schools, since it is in the schools that the proportion of milk used by the Indians is far greater than in the homes.

and district by district, to discover the open cases, and to provide supervision of those exposed to them. There can be no difference of opinion concerning the need for segregation of the open cases found. But to designate the best mechanism for carrying out the necessary segregation is at present impossible. It will require studies of administrative matters, of geography, topography, transportation, of the sociological relationships amongst the Indians of the various groups, and of the resources available in men, women and money; studies which lie beyond the scope of this investigation, and which must be based upon data that, so far as is known, are not yet assembled. It is clear, however, that the percentage of children to be cared for will be very high compared with the requirements of a white population.

It must be kept steadily in mind, in all considerations of the subject, that the two investigations now made and reported upon show definitely that at least 10 per cent, *i.e.*, 2,500 of the 25,000 British Columbia Indians, require now such close supervision as is outlined above; a majority requiring also institutional treatment. Successful home treatment under present conditions is absolutely impossible.

Obviously, one plan to secure the necessary institutional care would be the equipment of a small number (two or three) of large sanatoria at strategic points; for the coast Indians, not on the coast, but, say, on Vancouver Island; and for the interior Indians in due proportion to their population in the interior, north and south of the Canadian National Railway. As alternatives may be suggested the subsidizing of existing hospitals in the Indian country on a sufficient scale to ensure expansion great enough to take the cases to be segregated, thus scattering rather than concentrating the points at which segregation will be maintained; or, to the same end, the construction of a large number of small sanatoria at points throughout the territory under consideration, to be under the supervision of the present local physicians to the Indians.

The pros and cons of these broad propositions, of their details, and of the various combinations which might be made of them, cannot be discussed here. The epidemiological evidence desired has been collected, analyzed and presented. The conclusions as to the needs of the situation are clear and definite, but to secure the best, most economical, and most efficient organization to meet these needs is necessarily for the future, and requires data of a different character from those which this investigation was designated to collect. The decision will depend, ultimately and absolutely, upon the amount of money that may be available.

In the opinion of the investigators, in no other way than as broadly outlined above, can the present large morbidity and mortality from tuberculosis amongst these Indians be materially reduced.

## RESULTS WHICH MAY BE EXPECTED

Comparative tables, (Appendix, Table 13) supplied by the Provincial Board of Health of British Columbia, Statistics Division, through the courtesy of Dr. H. E. Young, Provincial Health Officer, show that these Indians, if tuberculosis were reduced to its present level amongst the whites, would have a death-rate little higher than the whites, and this despite a relatively high infant mortality rate (See, First Report; Appendix, Infant Mortality Rate—179).

If the infant mortality rate were cut also—and this would automatically occur to some degree if the tuberculosis rate were cut, on account of the general improvement in living as soon as this heavy incubus became reduced, the general death-rate would approximate that of the whites, or be even better. The latter would certainly occur if both tuberculosis and infant mortality be specifically, adequately, and persistently attacked by modern methods.

That all this would be advisable on humanitarian grounds alone needs no emphasis. But on sociological and economic grounds, the saving of the Indian population of British Columbia would constitute a deed of far-sighted statesmanship. For a long time to come the fur-trade will be the large source of revenue from the northern part of British Columbia, with the possible exception of the mineral resources. On the coast, fishing will be, perhaps, always the great source of wealth. The Indians constitute a people already settled in these districts, already fitting the conditions there. This is particularly true for the northern coast above Cape Mudge, where apart from lumbering and mining, the white man finds little suitable to do, and nothing which would tend to develop a white population.

No more immediate and valuable investment,

securing at once a sturdy, industrious and useful population in these otherwise vacant lands, can be hoped for than would result from the sagacious supervision and direction of the present Indian population, if combined with a real Health Campaign to get rid of the two impossibly high handicaps from which they now suffer, tuberculosis and infant mortality.

Dr Scott, Deputy Superintendent-General of Indian Affairs, hopes to print in full the very helpful reports assembled on the two years' investigations.

SECOND REPORT ON GOITRE AMONGST  
BRITISH COLUMBIA INDIANS \*

(*Relating to Indians of the Interior, 1927*)

Incidentally, the tuberculosis investigations made in 1926 and 1927, and under the auspices of the Canadian Tuberculosis Association, the Federal Indian Department, the Federal Health Department, the British Columbia Provincial Board of Health, the British Columbia Council on Tuberculosis, the University of British Columbia, and the Vancouver General Hospital, goitre was looked for in all Indians seen by Drs. C. H. Vrooman, A. S. Lamb and H. W. Hill.

As already reported in 1926, about 900 coast Indians, seen from Cape Mudge to Prince Rupert, showed a practically complete absence of enlarged thyroid. In one adult woman a small enlargement of the isthmus was detected (Hill); and in an Indian girl, who had lived away from the coast for four years, a general enlargement of the thyroid existed (Vrooman), and in this case the patient stated that it had diminished in size since

\* Approved by the Local Committee on Investigation on Tuberculosis amongst British Columbia Indians (F. C. Bell).

## GOITRE RESULTS

	Examined	Enlarged thyroid	Percentage	Sea-salmon in diet
Penticton *	56	1	1.8	some
Vernon				
Kamloops				
Merritt	434	52 (marked)	12.0	very little, if any
Enderby **			very low	some
Fort St. James				
Stoney Creek				
Laketown	354	8 (very slight)	2.2	some
Telkwa				
To				
Hazleton	123	1	0.8	plenty of sea-salmon
Coast	900	2	0.2	abundance of sea-salmon

\* The number examined here recorded means those actually examined for goitre. Many more Indians were seen, casual inspection of whom for goitre failed to show its presence. Dr. R. B. White quotes goitre as practically unknown amongst the Indians here, stating that the one recorded above was the *only* one in that neighbourhood. The percentage found was, therefore, much higher as reported, than it is in reality.

\*\* At Enderby Reserve we were informed by Drs. H. W. Keith, of Enderby, and P. D. VanKleeck, of Armstrong, that goitre was very rare amongst the Indians. Only four Enderby Indians were actually examined by the investigator. These were negative.

her return to the coast. In the remainder of the 900 Indians examined for goitre the results were absolutely negative.

The interior Indians, especially those of the Dry Belt, revealed in 1927, in very striking contrast, that goitre was very prevalent in some parts; less or absent altogether, in others. Moreover, it would appear that a correlation existed between these variations in prevalence and the use in diet of salt-water fish (salmon chiefly).

Dr. R. B. White, of Penticton, called our attention to the hypothesis that the presence of goitre amongst the whites, and the relative absence amongst Indians in the Penticton district and to the south, was due to the sea-salmon taken fresh from the rivers in that district; sea-salmon so worn out, bruised, and emaciated by their trip up the river that the whites refused to eat them, although the Indians eagerly used them whenever they could get them.

Our own observations, as above recorded, corresponds with these, the areas in which goitre was chiefly found being those in which sea-salmon-fishing has died out, or is dying out; while in those regions where sea-salmon are freely obtained, a minimal amount of goitre was discovered.

In the Okanagan Reserve, and those reserves in the neighbourhood of Merritt, goitre was not uncommon, particularly amongst the younger people and children.

The Northern Indians from Stuart Lake to the coast showed very little (8 in all), and each one found is recorded as slight or very slight. Only a single, very slight, case is recorded as far west as Hagwilget. These Indians, especially west of Stuart Lake, have plenty of sea-salmon.

#### SUMMARY

While the goitre records were made only incidentally, and it was not possible to go minutely into the details, the investigators were strongly impressed with the apparent correlation between abundance of sea-salmon and absence of goitre; and between absence of sea-salmon and abundance of goitre.

The explanation, under present teachings, would of course be that the sea-salmon supply iodine otherwise lacking. The whites who do not use this fish fresh, or in quantity, suffer from goitre, even in those districts where the Indians escape.

H. W. HILL.  
C. H. VROOMAN.

#### SECOND REPORT ON TRACHOMA AMONGST BRITISH COLUMBIA INDIANS\*

(*Relating to Indians of the Interior*)

As already reported in 1926, about nine hundred Indians of the British Columbia Coast from Cape Mudge to Prince Rupert, examined in 1926 by

\*Approved by the Local Committee on Investigation on Tuberculosis amongst British Columbia Indians (F. C. Bell).

Drs. C. H. Vrooman, A. S. Lamb and H. W. Hill, failed to show trachoma, or indeed any unusual prevalence of eye conditions, save that some interior Indians from the vicinity of Hazleton, seen at Port Essington and Balmoral, did show eye conditions, (which we considered not trachoma) notably in excess of the coast Indians proper.

Amongst the interior Indians, also about nine hundred, seen in 1927 by the same investigators, abnormal eye conditions were found to an extreme extent. These have been reported in detail, by name and domicile, to the Inspector of Indian Agencies, at his request.

The specific question regarding the presence of trachoma, asked by the Federal Department of Health, may be answered as follows: So far as their diagnostic skill extends, the investigators did not recognize as trachoma a single case of acute or sub-acute character, though acute and chronic conjunctivitis of various forms were prevalent. In a number of instances (twenty-five names can be furnished if wished), older people were found, nearly all at or above fifty years of age, who showed superficial keratitis, scarring of the upper lid, etc., such as is seen in old trachoma. These cases, when questioned, failed to give any history of associated cases at the time the trouble began. To discover, at one, two, or even three points, isolated cases of trachoma might be possible, but it seems unlikely that in a large number of such advanced conditions, if they were trachomatous, not one should give a history of any other neighbouring Indians suffering from eye trouble at the date that his own trouble began; and that not one should show other cases in his immediate family.

All the physicians to the Indians interviewed told practically the same story; that trachoma existed, but was rare. Pressed for details, they stated that such advanced conditions, as above outlined, were the cases which they called trachoma. In one instance, on discovering a case of this advanced form, the physician to the Indians, of long experience, who was present, volunteered the information, "That is what we have been calling trachoma." On evertting the lid, however, in this case, no scar tissue was found, and the investigator (H. W. Hill) was satisfied that this particular case was *not* trachoma.

#### CONCLUSIONS REGARDING TRACHOMA AND OTHER AFFECTIONS OF THE EYE

1. The coast Indians seen (about nine hundred) were practically free of even suspicious cases. Eye troubles of all kinds are relatively rare as compared with the interior.

2. The interior Indians seen (about nine hundred) showed about twenty-five persons whose eyes were suggestive of the terminal lesions of trachoma.

3. Histories obtainable pointed to the above being individual cases, not associated with similar

cases, early or late, in their immediate family or associates.

4. Acute or sub-acute cases of trachoma were not seen.

5. A great deal of acute and chronic conjunctivitis, *not* trachoma, is present amongst the interior Indians, together with much pterygium, some cataract, and other eye troubles.

6. Gonorrhoeal ophthalmia is not at all uncommon, both on the coast and in the interior. It is not usual to call a physician in case of con-

finement, so that infants' eyes go untreated until too late.

7. It has been stated on expert authority that tuberculous affections of the eyes have been found in the interior.

Very many of the cases seen require active expert treatment. Blindness and near-blindness, the result of lack of treatment, are exceedingly prevalent.

H. W. HILL.  
C. H. VROOMAN.

## Correspondence

### **Our Edinburgh Letter**

(From our own correspondent)

Some time ago a conference at which the Lord Provost presided, was held in the City Chambers to consider a scheme to promote the care and cure of crippled children throughout Edinburgh and the south-eastern area of Scotland. At this conference which was attended by representatives from hospitals and organizations interested in the scheme, it was agreed that the need was urgent. A committee was formed and has now reported that a special organization to deal with the matter is required. The members of the committee resolved:—

(1) That a central orthopaedic hospital should be built on the outskirts of Edinburgh.

(2) That major clinics should be formed in the more populous centres of the counties.

(3) That minor clinics should be formed in the remoter and less populous parts of the counties.

(4) That co-operation between existing hospitals and the new central orthopaedic hospital was essential.

It has been decided that a sum of £75,000 is needed to purchase a suitable site and to erect a hospital of 75 beds. This hospital is to be built on the open air plan with wide verandahs permitting the patients to be as much in the fresh air as possible. The central hospital will be the centre of the work, but the drawing together of outlying districts by the major and minor clinics is of the utmost importance. The fact that these small centres will enable children to have treatment continued in or near their homes should appeal to people in the country districts.

At a meeting of the Radium Society and Institute of Radiology held at the Central Hall, Westminster, the new x-ray department of the Royal Infirmary, Edinburgh, was characterized as probably the largest and finest example of its kind in Europe at the present day. In drawing attention to the importance of ventilation in such a department, Dr. Kaye explained that this was necessary, owing to the gases generated by high tension x-ray equipment being responsible for much of the debility, lassitude and anaemia

experienced by x-ray workers. Dr. Kaye quoted the case of one of the lay radiographers, as an excellent example. This operator began work in the old x-ray department of the Edinburgh Royal Infirmary in 1900 at 16. For years his average weight was nine stone and his health indifferent, except during holidays. He was on active war service from August, 1914, until August, 1919, doing no x-ray work, and living an open air life. His weight increased during this time to 11 stone 4 lbs., and his health was good. After the war he returned to the old x-ray department and was working under the old conditions. He gradually lost weight until he reached his old average weight of 9 stone. He was transferred to the new radiological department in August, 1926, and since then he has gradually put on weight, and at the present time is 11 stone 4 lbs., the weight which was his average during active service. With the increase in weight there has been a very noticeable improvement in his general health. Dr. Woodburn Morrison, the head of the department, attributes this to the efficient protection of the apparatus, the excellent lighting and ventilation, and to the fact that the working hours are not more than seven per day, with Saturday afternoon, Sunday and half a day in the middle of the week off work, in addition to one month's holiday during the year.

The Edinburgh Medical Curling Club held its annual dinner on Wednesday, 11th January, after a hard game against three Lanarkshire rinks. As the three opposing skips were William Jackson, probably the finest curler in Scotland at the present day, Tom Murray and A. B. Clarkson—all three international skips—it is not surprising that the Edinburgh Medicals were beaten. The dinner afterwards was a great success, one of the guests being Dr. Culbertson, of White Horse, Yukon, who is at present doing post-graduate work in the city.

Dr. Sidney Smith has been appointed to the Chair of Forensic Medicine rendered vacant by the death of Professor Harvey Littlejohn. Dr. Smith graduated in Edinburgh in 1912 with first

class honours. For the past ten years he has occupied the posts of Professor of Forensic Medicine in the University of Cairo and Principal Medico-legal Expert to the Egyptian Government. He has played a notable part in the detection of criminals, not the least among them being his share in bringing to justice the murderers of the late Sirdar, Sir Lee Stack, Pasha. He is also the author of a text book on Forensic Medicine.

After being closely associated with the Edinburgh Royal Infirmary for over 40 years, Dr. James Haig Ferguson has retired, under the age limit rule, from the charge of wards in the gynaecological department. Dr. Hugh S. Davidson has been appointed to the charge of the wards in succession to Dr. Haig Ferguson and Dr. Douglas Millar was elected an assistant gynaecologist to the institution. Dr. Haig Ferguson has also retired from the Staff of the Royal Maternity and Simpson Memorial Hospital and Dr. Hugh S. Davidson has been appointed in his place.

It has been decided to perpetuate the memory of the late Professor Francis Caird, who lectured on surgery in the extra-mural school and who succeeded Professor Annandale in the Chair of Clinical Surgery, formerly held by Lord Lister and James Syme. A committee has been formed and it has been decided to found a memorial which shall include a prize and a medal which will be offered biennially for the best essay in surgery or surgical pathology based on personal observation and research; the subject to be chosen by the candidate.

One of the signs that the war and its effects are receding further and further into the past, is the closing of Craigleath Hospital. This hospital, which is in the immediate vicinity of Edinburgh, was No. 2 Scottish General Hospital during the war. Lately it has been growing gradually smaller and smaller. The few remaining patients are now to be transferred to a smaller pensions hospital at Edenhall, near Musselburgh. Including the accommodation still available at Bellahouston Hospital, Glasgow, the total number of beds remaining for pensioners in Scotland will be less than 250.

GEORGE GIBSON.  
23, Cluny Terrace, Edinburgh.

#### **Our London Letter**

(From our own correspondent)

*Oculists or Opticians?*—Although not attracting the widespread interest of, say, "the bone-setter controversy" in the lay press, there has recently been much interest in certain circles in the relationship of the profession to quite a different set of "unqualified" workers, namely, the sight-testing opticians. A departmental committee was appointed about a year ago to consider a Bill promoted by the Joint Council of Qualified

Opticians, called the "Optical Practitioners' (Registration) Bill," and a report has just been issued. On the face of it, registration of sight-testing opticians would seem desirable, to enable the public to recognize which are the most competent opticians, and to produce some sort of order out of the present chaos, whereby it is within the discretion of an approved insurance society to decide whether a member, who has been recommended for ophthalmic benefit by his insurance doctor, should be sent for examination to an oculist—that is a qualified medical man who has made a special study of the treatment of the eye,—or to an optician. The amount of money available in grants for ophthalmic benefit has some bearing on the matter, for an oculist's fee is one guinea, as against five shillings charged by an optician, and yet there is always the danger that a defect in vision, not due to an error of refraction, may be unsuitably treated by a non-medical man. Indeed the majority report of the committee is against the present setting up of a State register of opticians, largely on these grounds, stating, "We are not satisfied that even those opticians who are most highly qualified in all other respects are sufficiently trained in this respect." On the other hand there does appear to be an urgent need of more oculists to provide services on terms which will make them more accessible to the public, insured and non-insured, and certain movements are on foot in this direction. The result of such an extension of the services of oculists must therefore be awaited before any further steps are taken towards the registration of opticians. The representatives of the latter are not likely to let the matter rest there, and some action is expected on their behalf.

*London Rheumatic Clinic.*—The well-to-do man or woman with one of the mysterious disorders grouped as "rheumatism" is generally sent to a spa. For the working class, the "insured" class of the population, there is nothing corresponding. It is estimated that one-sixth of all sickness absence in industry is due to this cause, and the amount of treatment which the hospitals can give in their physio-therapeutic departments, though excellent, is not nearly sufficient to cope with the situation. The alternative to the spa appears to be the "town clinic," where all forms of manipulation and exercises, radiant heat, and electrical treatment can be carried out. In Berlin, it is reported, there are forty-six such institutions and it has recently been announced that the British Red Cross Society is proposing to establish clinics in thickly populated centres throughout this country. The first is to be in London, where an option has been secured on a suitable building, to adapt and equip which a sum of £40,000 is necessary, of which £15,000 is already promised. The insurance societies are naturally greatly interested and the Ministry of Health has given a definite undertaking that these societies will be allowed to pay capitation rates on behalf of their members when such a clinic becomes available. It is thus hoped that, when

once established, the London Rheumatic Clinic may be self-supporting, for the great majority of those attending will be willing and able to pay a reasonable fee for treatment. The leaders of the medical profession have shown their interest in the scheme, the development of which is eagerly awaited.

*Sir Dawson Williams.*—In January, Sir Dawson Williams retired from the editorial chair of the *British Medical Journal*, after thirty years' work as editor, and in all nearly fifty years' service with the *Journal*. His ability and devotion were inestimable, and his guiding hand led the profession successfully through many difficult periods, including not only such obviously stormy times as the passing of the Insurance Bill, but also during a less hectic, but quite as revolutionary, period when modern scientific medicine began to come up alongside the traditions of many centuries. Much has been written of the peculiar sagacity and wisdom which Sir Dawson Williams possessed, but, on a more personal note, the present writer can testify to one of the aspects of the character of this great editor, which without doubt was partly the secret of his success, and that was his painstaking attention to detail. No contributor was too junior or insignificant but Sir Dawson was interested in his work, and his kindly criticism has helped many young writers to cultivate that simplicity and directness of style which he always encouraged. It will be difficult for his successor to follow him, but Dr. Gerald Horner has for eleven years filled the position of assistant editor with conspicuous success, and the reputation of the *British Medical Journal* is in safe hands.

London, February, 1928. ALAN MONCRIEFF.

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LETTER FROM BRITISH COLUMBIA

*To the Editor:*

When on June 30, 1927, Dr. E. J. Rothwell, of New Westminster, died suddenly at Quesnel, while on a holiday, medicine in British Columbia and in Canada generally suffered a serious loss. There are men who will take his place in purely medical work and in the British Columbia Legislature, for "There is no necessary man,"—but where will the medical profession of British Columbia find one who will carry on his work for the profession of medicine in the halls of our law-givers.

Dr. Rothwell was a happy combination of the old and the new in our profession—the old conscientious general practitioner—a man of the highest ideals, always endeavouring to remind organized medicine of to-day that

"Not in entire forgetfulness  
And not in utter nakedness,  
But trailing clouds of glory do we come,"

and his fear was that the medicine of to-day would lose some of its glorious inheritance. Surgical dexterity and laboratory diagnosis, which makes possible the advanced medicine and surgery of to-day, with him always demanded a higher standard of conscientious integrity on the part of the whole profession. In the administration of the Workmen's Compensation Board, and in the advent of some Government measure of health insurance or state medicine, he saw a supreme test of the conscience of our profession. That the ideals of Dr. Rothwell may become materialized in organized medicine, is the hope of all its well-wishers to-day.

In the proposed new medical building in Vancouver we see one more evidence of the unification of the medical profession in this province, which has been made possible through the activities of the British Columbia Medical Association, in co-operation with the Vancouver and Victoria Medical Societies. The success of a similar venture in Winnipeg, both from a financial and from a spiritual point of view, has been very gratifying, for it serves not only as an office building but also as a medical club.

The continued growth in size and development in character of the *Vancouver Medical Bulletin* must be a source of great satisfaction to the parent society. The articles are the record of careful and thoughtful work, earnestly and conscientiously done, and through this medium valuable original work is reaching the reading section of the profession. Through co-operation between the Vancouver Medical Society and the British Columbia Medical Association, the *Bulletin* is sent to all members of the provincial organization who reside outside of Vancouver.

The second annual tour of the Canadian Medical and Sun Life post-graduate team has been completed, and has repeated the success of its predecessor. At these meetings, the all too rare opportunity of meeting your medical neighbours, who, in this province, may be 50 or 150 miles distant from you, was thoroughly enjoyed. Old university associations were given renewed vigour, both in body and soul, as old pupils met their erstwhile professors, not as pupil and teacher, but as fellow-practitioners. The lectures were all excellent, and practical, and such a happy combination of scientific research and sound common sense that one frequently thought of Oliver Wendell Holmes' remark:

"Science is a first class piece of furniture for a man's upper chamber, if he has common sense on the ground floor; but if a man has not got plenty of good common sense, the more science he has, the worse for his patients."

That state health insurance in some form or another may soon become an important issue in British Columbia politics is by no means an impossibility. Two years ago, the principle was endorsed by the Hospital Association of British Columbia at its Nanaimo meeting. Recently, however, the approval of various municipal councils, trades and labour organizations, and the Farmers' Institute have stamped health insurance as current politics. So evident is this, that the *Vancouver Daily Province* has published a leader on the subject in which it was stated: "The arguments in favour of such a system in British Columbia are many and persuasive; the objections to it are few and unconvincing; but it is not a thing easily done, and it is particularly the sort of business in which an unsound proposal here or there might easily wreck a splendid intention. . . . State health insurance, whatever else it can be made, ought to be part of an organized education in health. It ought to serve the purpose of an improved status for the medical profession, and increase the value of that profession to the community."

Should such a measure come before the legislature, the necessity of our provincial medical organization will be apparent to all. Since its inception, the British Columbia Medical Association has foreseen such a possibility, and the splendid work done by Dr. J. H. MacDermot, in defining and popularizing two fundamental principles, from the professional point of view, will undoubtedly clarify the situation. These principles are: (1) Free choice of physician; (2) Payment for services rendered. Any measure of health insurance, if it is to receive the support of the public at large, or of the organized medical profession, must build on these as the chief corner stone.

H. H. MURPHY

MACKAY MEMORIAL HOSPITAL,  
TAIHOKU, JAPAN

To the Editor:

I wish to write and thank you very heartily for your so kindly sending me the *Canadian Medical Association Journal*. It is a welcome, stimulating, helpful, monthly visitor.

I enclose a photograph of our leper work, for which we have recently opened a special department. It is only an out-patient clinic, as there is up to date no segregation law, nor colony, for such patients. We are hoping in time to establish a residential colony. We have two clinics weekly, with a weekly average of one hundred patients.

G. GUSHUE-TAYLOR

Mackay Memorial Hospital,  
Taihoku, Formosa, Japan.  
Nov. 14, 1927.

MEDICAL MEN AND NARCOTICS

To the Editor:

We notice in the January issue of your publication an article entitled, "Medical Men and Narcotics—A Warning", dealing with the Opium and Narcotic Drug Act and pointing out particularly the dangers that a physician encounters in treating a drug addict.

May we mention, in passing, that "Codeine or any salts or compounds thereof" was some time ago deleted from the schedule of narcotic drugs.

We wish your article had gone a great deal farther than it did, and had given the essential features of the Act, not only as regards the danger to the physician in prescribing narcotics for the use of addicts, but also the requirements of the Act in respect to prescriptions. We have complaints from druggists all over the country that physicians do not seem to realize the severe penalties to which the druggist may be subjected unless the order, or prescription, he receives from a physician is in the form prescribed by the Opium and Narcotic Drug Act.

The druggists ask the co-operation of physicians in aiding them to comply with the law, and we believe that can only be obtained by the physician having a better understanding of the Narcotic Act. We would appreciate, therefore, if you would draw the attention of your readers to the following provisions of the Act:—

1. A druggist is liable to a minimum fine of \$200, if he fills a physician's telephone order for narcotics. He must have the prescription, or order, duly signed and dated *on his premises*, and the signature verified, before the prescription, or order, can be filled.

2. A druggist cannot accept a repeat order of a prescription for narcotics over the telephone, except in such cases where the narcotic content comes within section 8 of the Act. Otherwise a new prescription or order must be written on each occasion.

3. A druggist living in a border town cannot fill a prescription, or order, of a physician living



Group of leper patients at the back of the leper dispensary. Mackay Memorial Hospital, Taihoku, Formosa

in a province other than the province in which his drug store is situated.

These provisions apply not only to prescriptions, or orders, for morphine, cocaine, heroin, etc., but also to prescriptions containing in addition to other drugs, small quantities of Tinct. Camph. Co., Tinct. Opii, Heroin, etc.

We can assure you that the druggists of Canada are anxious to serve the physicians to the best of their ability, and we believe that when physicians understand that if a druggist fills a telephone order for narcotics, he is liable to a minimum fine of \$200 and costs, and be branded as a criminal, they will realize why he

cannot, in justice to himself, accept such telephone orders, and will place the blame, if there is any, on the Narcotic Act and not on the druggist.

W. B. J. HANBURY  
Secretary

30 Victoria St., Toronto,  
Feb. 14, 1928.

*We have already referred to these new laws regarding the prescription of narcotic drugs in our February issue. The matter, however, is an important one, and the attention of every member of the profession should be drawn to it.*  
—EDITOR.

## Abstracts from Current Literature

### MEDICINE

**Ueber die Pathologische Anatomie der Angina Pectoris (On the Pathological Anatomy of Angina Pectoris).** Kutschera-Aichbergen, H., *Wiener klin. Woch.*, Jan., 1928, i, 6.

The author points out the difficulty in orienting the pathological findings with the clinical features, for the reason that angina pectoris as an entity is a transient state, and the anatomical picture eventually found is rarely an end-result. Again, the commonest backgrounds in which angina pectoris is manifested are, syphilitic aortitis and coronary artery sclerosis, two differing conditions.

Angina pectoris is somewhat more frequent in cases of aortitis with coronary stenosis, but may be found in the absence of the latter condition. Very rarely, angina pectoris may occur with complete normality of the aorta and coronary arteries. Contrariwise, aortitis, coronary sclerosis, and myomalacia cordis may occur without the development of angina. Up to the present time, not much advance has been made in elucidating angina pectoris as a symptom. Oberndorfer, on the basis of a pathologic-anatomical examination of 17 cases, came to the conclusion that the only explanation was a "functional disturbance," perhaps "spasm."

The author thinks it probable that the pain in cases of aortitis is due to a sudden distension of the aorta, provided that the wall is not too calcified to prevent expansion. In such cases the coronary arteries are often free from atheromatous plaques, and, therefore, competent to contract. Yet, it is difficult to see why such arteries, even when their orifices are partly occluded by sclerotic patches in the aorta, should be liable to undergo spasm.

In three of his cases the author found coronary sclerosis and myomalacia of the heart-wall, together with quite enormous distension of

the coronary lumina and thinning of the muscular wall.

The author inclines to the view that distension of the aorta or of the coronary vessels explains the occurrence of angina pectoris better than the cramp-theory.

A. G. NICHOLLS

**Pneumocephalus of Bacterial Origin.** Dandy, W. E., *Arch. Surg.*, Dec., 1927, xv.

The only two possible sources of air within the cranium are from (1), its being forced through a break in the cranial walls, or from (2), its being generated by gas-producing bacilli. The present paper presents the report of a case of pneumocephalus, with a review of the literature on similar cases. Their rarity is shown by the fact that only three others are reported.

Dr. Dandy's case was that of a boy of six years, on whom an operation had been performed, following a history of chronic aural discharge with a final acute mastoiditis. The dura was found to be covered with granulation tissue but there was no evidence of perforation. A week after operation there were severe headache, vomiting, and slowing of the pulse from 120 to 64. There was marked double papilledema. The temperature remained normal.

Exploration in the temporal region with the ventricular needle revealed an abscess from which foul-smelling pus was withdrawn, and it was necessary to repeat the tapping a week later, when bubbles of gas were seen to spurt through the needle. The intracranial pressure increased so rapidly that it was necessary to tap the abscess repeatedly, until it became a daily proceeding. The gas was found to increase in amount, whilst the pus lessened. Continuous drainage was eventually resorted to. Discharge ceased within five days. Six weeks after the first tapping the roentgenogram

showed no shadow of air (compared with the large collection it had shown at first), and a week later the patient was discharged well.

A year later he was still perfectly well, and had shown no motor or sensory changes and no convulsions.

The organism producing the gas could not be identified, in spite of the most careful bacteriological investigation. It was non-motile, non-spore bearing and did not grow aerobically: clearly it was not the *B. aerogenes capsulatus* of Welch.

In two of the other cases reported the organism proved to be *B. aerogenes capsulatus*, but there were no signs of systemic disturbance, such as might be expected from an organism of such virulence. The signs and symptoms were almost exclusively those of intracranial pressure. All of the four cases were cured by continuous drainage.

H. E. MACDERMOT

**Elliptical and Sickle Shaped Erythrocytes in the Circulating Blood of White Persons.**

Lawrence, J. S., *J. Clin. Investigation.*, Dec. 20, 1927, v. 31.

Sickle shaped cell anaemia was first described by Herrick in 1910, by Huck in 1923, and by Sydenstricker in 1924, and by others. The condition up to the present has only been met with in negroes, and many observers have considered the racial element to be of great importance.

Lawrence records a case of this affection in a white woman. Investigation of her family revealed that one brother, one sister, and one niece had both sickle shaped and long slender erythrocytes. One brother and one sister were normal.

A study of the blood in 102 normal white persons, composed of medical students and nurses, resulted in the discovery of sickle shaped red corpuscles in 3. For comparison, a series of 100 negroes, students, patients, employees, and visitors to the hospital, was taken. Of these, 5 (four patients and one visitor) showed the condition. The negro patients were suffering from myocardial failure (1), syphilis and hypertension (2), gonorrhoea (3), congenital syphilis and generalized tuberculosis (4). The white patient had a secondary anaemia, and symptoms suggestive of degeneration of the posterior columns of the spinal cord.

The etiology is quite obscure, and several theories have been advanced to account for the condition.

A. G. NICHOLLS

**Intratracheal Injection of Lipiodol: Generalized Iodide Eruption; Death.** O'Donovan, W. J., *Brit. M. J.*, Nov. 19, 1927.

The case reported is a reminder of the untoward effects which may result from the in-

jection of lipiodol, in virtue of its iodine content. The patient, a man aged 40, presented symptoms of pulmonary phthisis, both apices being involved. There was a short frequent cough and greenish morning expectoration, but no fever; there was a slight degree of clubbing of the fingers. The skin showed a number of scattered pustules in the hair-follicles of the trunk. The general condition otherwise revealed nothing of importance.

About three weeks after his admission to hospital an injection of 20 c.c. of lipiodol was given by the intratracheal route, and an x-ray of the lungs was taken. Ten days later his temperature rose to 101° having been very irregular in the interval, and in the following ten days great numbers of small boils began to appear on the trunk and limbs. The cough became more frequent and severe. Later on, both forearms became covered with vesicles, and these spread to the greater part of the body surface. Several who saw the patient in the last three days suspected variola, but there was nothing to support this diagnosis. The vesicular fluid was examined, but gave no colour with starch paper, and no iodides were found in the urine.

The patient died from bronchitis and heart-failure, but post mortem examination was not permitted. There seemed to be little doubt that the eruption was one of the recognized types of eruption on the skin that may follow the absorption of iodides.

H. E. MACDERMOT

**Pneumothorax Spontané au Cours de Deux Grossesses. (Spontaneous Pneumothorax Occurring in Two Pregnancies).** Duhot, E., *Bull. et Mém. Soc. Méd. d. Hôp. d. Paris*, Jan. 19, 1928, p. 31.

The author gives a short account of a remarkable case in which spontaneous pneumothorax occurred twice in the same patient during the course of pregnancy. The patient was a woman aged thirty-four years. When well advanced in her first pregnancy she suddenly, and without obvious cause, developed pneumothorax. Tuberculosis was excluded. The only abnormality discovered was albuminuria. She subsequently went through two more pregnancies without untoward event. About four years from the date of her first attack of pneumothorax, when two and a half months pregnant, she again suffered from the condition. At this time her blood pressure was elevated. Tuberculosis was excluded. Each time the pneumothorax disappeared without leaving a trace. In the absence of the usual cause for the condition, the pneumothorax was attributed to the probable rupture of an emphysematous bulla in the lung.

A. G. NICHOLLS

## SURGERY

**Empyema in Children.** Farr, C. E. and Levine, M. I., *Surg., Gynæc., & Obst.*, Nov., 1928.

In this paper 371 cases of empyema in children are reviewed, as regards age, year of incidence, and organism involved. The disease in children, as far as the authors can judge, is always a secondary process, usually arising from a previous attack of pneumonia. Two hundred and thirty-six cases had their origin in this disease.

General hygiene and social status appear to have a bearing on the incidence, and this opinion is based not only on personal observation but on personal communications with a number of paediatricians. The authors further assert that their figures are in agreement with those of Holt, who found the highest incidence from the condition during the second year. However, the mortality rate was much higher during the first year of life than during any of the succeeding years. During the first year the rate was 66 per cent, whereas during the second it was 33 per cent. After the second year the mortality rate steadily declines until about the age of 6 years. After that time the deaths are few, and usually the result of some severe complication. The total mortality rate of the 371 cases was 19 per cent.

As to etiology, the most common organism is the pneumococcus, which carries with it a mortality rate of about 25 per cent. The streptococcus gave a mortality rate of 26 per cent; staphylococcus, 66 per cent; mixed infections, 42 per cent; and 30 per cent were sterile. As regards sex, there was a slight predominance of males over females, which is in marked contrast to the figures reported for adults, in which the proportion was 2 males to 1 female.

The most common symptoms found are, the continued fever after the previous illness, the dyspnoea, cough, and the condition of anorexia and general malaise. Empyema can be easily diagnosed by physical signs, aspiration, and the roentgen-ray. There was difficulty in diagnosis in some cases until x-ray plates were made, as the empyematous cavity was situated between two lobes of the lung at some distance from the chest wall. A study of the leucocyte and differential blood counts presents the most bizarre figures, and no prognostic deductions can be made from these features.

Regarding treatment, the first measure taken was aspiration, done not only to drain the pus but also to determine the nature of the fluid. In early cases with thin fluid, aspiration was continued until conditions favoured open drainage. Aspiration was used alone in only 3 cases and all of these patients died. They were very ill and operation would probably only have hastened the end.

In all other cases open drainage was used. Resection of the ribs was resorted to 168 times, and in this group there was 30 deaths, a mortality rate of 18 per cent. Intercostal incision with open tube was used 58 times, with 19 deaths (33 per cent). This latter high mortality is due largely to the fact that it was frequently used when the patient was too ill to undergo general anaesthesia and the shock of a rib-resection. In the hands of the surgeon who uses only intercostal incisions the mortality rate is low compared with that of other operators who rely on rib resections. The use of Dakin's solution did not give brilliant results when used to cleanse the open cavity, but, on the other hand, seemed to be disturbing to the patient, and in that way outweighed any advantages.

Complications are frequent in empyema. Blocking of the exit is really an incident rather than a complication, but it must be constantly kept in mind. Pocketing is fairly common, but in children is usually simple, easily detected, and as easily remedied. Aspiration of the tube is occasionally seen, and a loss of part of the tube within the chest cavity is a rare accident. Osteomyelitis of the rib occurs in a small proportion of the cases, and again the x-ray is of great assistance in detecting the presence and extent of the trouble. Osteomyelitis of the rib also occurred where the intercostal type of drainage was performed, but was rather less frequent than where rib-resection had been performed. Acute anaemia of varying degree is a constant complication of empyema and, if severe, the judicious use of blood transfusions is to be commended. It is also to be remembered that in drainage of the cavity, the child is losing a great deal of body fluids as well as body proteins, and it is necessary to force fluids and to give plenty of nourishing food.

The prognosis depends upon a number of factors, the most important of which are, age, complications, virulence of the organism, condition of the patient, and treatment. There seems to be little relationship between the time from the previous illness to the diagnosis of empyema and the mortality.

So far as the surgical treatment is concerned, the most important factor is the knowledge of when to operate. Operation before the pus is thick and the cavity well walled off increases the gravity of the prognosis to a marked degree.

R. V. B. SHIER

**Radium Implantation in Oesophageal Cancer.** Muir, J., *Laryngoscope*, Sept., 1927, xxxvii, 660.

Cancer of the oesophagus is generally regarded as the most hopelessly incurable of malignant lesions. None of the forms of treatment which have proved successful in combating cancer elsewhere in the body have heretofore been possible

of application to the oesophagus. Radium has been even less beneficial than surgery. Three prime drawbacks to the use of radium have always existed: first, the difficulty of placing it accurately; second, the practical impossibility of maintaining it in position long enough to be effectual; and third, the great danger of burning the tissues, which will induce sloughing and fistula into the mediastinum—invariably a fatal accident.

To obviate these difficulties the author has elaborated a technique of radium implantation through a specially designed oesophagoscope, which can be readily carried out by anyone experienced in the use of this type of instrument. The field of operation is illuminated and an implanter passed through the tube, so that each radon seed may be placed in full view, and the entire lesion accurately mapped out and evenly implanted. The radio-active centre employed is a removable platinum radon seed, which offers the double advantage of being so screened that it will not induce necrosis, and the possibility of removal by means of an attached thread, so that no foreign bodies are left in the tissue after the contained radium emanation has entirely decayed. The entire procedure is facilitated if done under the fluoroscope, though this is not absolutely essential.

The results in the small series of cases so far treated by this method have been highly gratifying, and although no permanent results can be reported before the lapse of five years, the author feels that the method merits a wide trial, even if it proves to do no more than prolong lives which otherwise would be very shortly terminated.

**Carcinoma of the Oesophagus.** Clayton, E. S.,  
*Surg., Gynaec., & Obst.*, January, 1928.

The oesophagus is a musculomembranous tube, 25 centimetres in length. In its length four areas of constriction are commonly agreed upon, one at the very beginning, a second at the passage through the diaphragm, a third at the point where the arch of the aorta crosses, and the fourth where the oesophagus passes behind the origin of the left bronchus. These points of constriction seem to be closely related to the positions at which carcinomata develop.

The lymphatics of the oesophagus are arranged in two networks, one submucous, and the other in the muscular coat. The lymphatics in the cervical portion pass to the superior deep cervical and retropharyngeal nodes; those of the thoracic portions, to the posterior mediastinal nodes; and those originating in the terminal portion, to the cœliae group. From these three groups of nodes there is hardly any limit to the anastomoses of lymphatics in the

neck, chest, and abdomen, all of which help to explain some of the extensive metastases of cancers of the oesophagus.

In an analysis of 5,900 autopsies, performed in the past five years at the Philadelphia General Hospital, there were forty-one cases of carcinoma of the oesophagus. Thirty-nine, or 95 per cent, were in men, and eight occurred in the coloured race. The youngest patient was 41, and gave a history extending over twenty-four months, which was the longest duration of symptoms of any of the cases. Of the 41 patients, the average age at death was 60 years and 6 months.

Difficulty in swallowing was the commonest symptom and, in fifteen of the cases, was the only symptom for a long period of time. Weakness and loss of weight were early and constant symptoms. They were the first symptoms in many cases, and were present in all cases but one.

Pain and vomiting were comparatively infrequent symptoms. Epigastric pain of a mild degree was present in 7 cases. Only one patient complained of actual pain on swallowing. This pain was of a very severe degree, and of a burning character, occurring two months before death, and preceded by three months of difficulty in swallowing. Vomiting was an early sign in 3 cases, and 2 of these were accompanied by nausea, and metastatic ulcerative areas were found in the stomach.

Cough was a prominent symptom in 10 cases due to an involvement of the trachea, bronchi, or lungs by the metastatic growth. Spitting of blood occurred in 11 cases and hoarseness was present in 5.

In most of the cases, wherever possible and indicated, a gastrostomy was performed; it seemed to have little or no effect in prolonging life, except in cases of obstruction.

The middle third of the oesophagus was most frequently the seat of the primary lesion, and the centre of the lesion was most commonly above the area of constriction where the oesophagus is crossed by the left bronchus.

Of the 41 cases comprising this study, metastases occurred below the diaphragm in 22. In 9 of these they were extensive, involving the liver in 11 cases and the glands of the front of the stomach and the cœliae chain in 8. There were only 9 cases in which metastases were only found above the diaphragm, while in 18 cases there were metastases both above and below the diaphragm. Ten cases did not show metastasis.

The greatest difficulty in making an early diagnosis does not depend on our present day methods of procedure, but upon the fact that carcinomata of the oesophagus do not cause recognizable symptoms until very late.

R. V. B. SHIER

## OBSTETRICS

**The Influence of Fibroids on Pregnancy and Labour.** Polak, J. O., *Surg., Gynaec. & Obst.*, January, 1928.

Fibroid tumours of the uterus may produce sterility, either by impairing fertility or by favouring abortion. About one-third of all patients with this neoplasm are sterile, while 21 per cent of those who do become pregnant, abort.

The effect of the growth on pregnancy and delivery depends on the location of the fibroid. Interstitial and subperitoneal tumours of the fundus, even though they increase considerably in size, will probably have little effect on the pregnancy. Placenta accreta, abnormal presentations, and low implantations may result when pregnancy is complicated by a submucous tumour. Labour is, therefore, more complicated, and the foetal and maternal mortality increased from three to six times the average.

Due to increased vascularity, 13 per cent of fibroid tumours show some form of degeneration during pregnancy. Red degeneration, especially of interstitial tumours, is common, and is characterized by sudden pain followed by slight bloody vaginal discharge, a rise in both pulse and temperature, leucocytosis, decreased sedimentation time, and an increase in the size of the growth. Necrosis of a fibroid may lead to puerperal sepsis and postpartum haemorrhage.

Growths impacted in the pelvis, may prevent any form of vaginal delivery. Intramural tumours, by affecting uterine contractions, usually delay the first and second stages of labour, and predispose to postpartum haemorrhage in the third stage.

As to treatment, the author believes that women with myomata will go through pregnancy with but little difficulty. Any operative procedures should be delayed until the child is viable. The knee-chest position helps to prevent a tumour being incarcerated. Red degeneration should be treated medically rather than surgically.

ELEANOR PERCIVAL

**Radiological or Operative Treatment of Cancer of the Uterus.** Heyman, J., *Acta Radiologica*, vol. viii, Fasc. 5, No. 45.

Since 1920, all cases of carcinoma of the cervix occurring in Sweden, whether operable or inoperable, have been treated with radium rather than by hysterectomy. In the present paper, the author tries to solve the question of operative versus radiological treatment, by statistical data.

Before making this comparison, the author reminds us that the ultimate results obtained by hysterectomy are the results of a method carefully elaborated in every detail, while, on the other hand, the radiological results are still under improvement; also, that operative therapy began with the most favourable cases, and only gradually passed on to the more advanced, whereas radiotherapy commenced at the other end.

In 5,806 cases of cervical carcinoma, treated by operative means in twenty different clinics, the absolute cure was 19.1 per cent, with a primary mortality of 17.2 per cent. If only the early cases be included, 35.6 per cent of these cases showed no recurrence in five years. Between 1914 and 1921, five hundred and two cases were treated at the Radiumhemmet in Stockholm with 23.3 per cent of cures, and a primary mortality of 1.59 per cent. Among the operable cases, 46.2 per cent were cured by radium. From the above figures, it is clear that radium treatment of cancer of the uterine cervix is superior to hysterectomy. Not only are the results better, but the risk and inconvenience to the patient are much less, and the palliative effect of radiological treatment in the more advanced cases adds much to the advantage of the treatment.

In carcinoma of the fundus, although hysterectomy has formerly been considered the method of choice, statistics show that as good results can be obtained by radiological treatment as by operative treatment, i.e., a cure in 45-60 per cent of cases.

ELEANOR PERCIVAL

## ANÆSTHESIA

**Spinal Anæsthesia in Obstetrics.** Cosgrave, S. A., *Am. J. Obst. & Gynaec.*, 1927, xiv, 751.

Spinal anaesthesia is ideal in any operative procedure in pre-eclampsia or eclampsia. Most of the dangers of the method occur in inexperienced hands. The effect on uterine contractions is to lessen or abolish them at first. They return with their former vigour in from fifteen to thirty minutes. The irritability of the uterine muscle is not abolished. Within a few minutes of the injection mechanical irritation of the cervix, such as occurs in forceps extraction, will induce uterine contractions. If the injection is made in the fourth space the contractions may be painful; if it is made in the third space, pain is slight or absent altogether. Post-partum tone is not lessened. The duration of anaesthesia is from forty minutes to an hour.

W. B. HOWELL

## Obituaries

**Dr. Daniel Rolston Dunlop**, a graduate of Toronto University and a prominent physician of Calgary, died at his home on December 7, 1927, after an illness of four weeks following a cerebral haemorrhage.

He was born at Milverton, Ontario, fifty-seven years ago. After his graduation from the high school at Harriston, he taught for several years before entering Toronto University in 1897.

Following his graduation in Medicine in 1901, he practised at Shallow Lake, Ontario, until 1907, when he decided to come to Alberta.

In this year he settled in Calgary, where he practised until 1915, after which he joined the Canadian Army Medical Corps. He was appointed medical officer of the 137th Battalion, with which unit he went overseas in 1916. He served with the Fifth, and later with the Eighth, Field Ambulance, as well as with the Forty-second Battalion.

He was invalided to England in 1917, suffering from an illness which remained with him until the time of his death. He returned to Calgary in 1919,

He ranked high in his professional work, and as a surgeon he possessed sound judgment, conscientious to a degree in the care of his patients. The sympathy of his confrères in Calgary is extended to his widow and the son and daughter who survive him.

G. E. LEARMONT

**Dr. James Warburton.** We have to record the death, in his seventy-third year, of Dr. James Warburton, who was for many years chief of the medical staff of the Prince Edward Island Hospital, and had long been a distinguished figure in the professional, political and military life of this province.

James Warburton was the son of the late Hon. James Warburton, a native of Ireland, who came to Prince Edward Island in 1834, and became a member of the first administration formed in this province under responsible government, and for a number of years filled the offices of Provincial Secretary and Provincial Treasurer.

Dr. Warburton was born on June 30, 1855. He received his elementary education in the public schools, followed by four years at St. Dunstan's College. Subsequently he passed through Prince of Wales College and King's College, Windsor, N.S., from whence he went to Edinburgh, entering the medical department of that university from which he graduated in 1880. He was one of the dressers to the great Lister and was a classmate of Dr. Conan Doyle. Dr. Warburton first practised in Fifeshire, Scotland, where he remained for two years. He returned to his native province in 1882, and entered the medical profession of Charlottetown, where he remained in active practice until the day he left for Montreal, only two weeks ago. Although his practice was one of the largest in the province, the doctor found time to actively participate in public life and give unselfishly of his talents and experience in the interests of our people. In 1897, he was elected Mayor of Charlottetown, in 1900 was elected by acclamation, and, again, in 1902 he was chosen for a third successive term for this honourable and responsible position. While occupying the chair of Chief Magistrate of the capital of the province he discharged his duties with efficiency and general satisfaction.

In 1903 he was elected to represent Charlottetown in the Provincial Legislature in the Liberal interests, and in the general election in 1904 he was elected with the largest majority ever polled in this electoral district. He was re-elected by acclamation in 1908, and continued as a member till 1912. As a member of the Legislature the doctor gave unsparingly of himself, his talents, and his time, in advocating and working for what he believed to be in the best interests of our city in particular and the province as a whole. Later he found it impossible to devote the necessary time to his large practice and the insistent demands of politics, and he accordingly declined to become a candidate for parliament, but as President of the Provincial Liberal Association he continued his political activities.

The doctor was associated with the military service for many years. He joined the 82nd Battalion, the largest military organization here, in 1883, of which he was a medical officer, and step by step rose in the militia until he attained the rank of Colonel. In his military connection he displayed the same interest and vigour that characterized him also in his association with other organizations.

He was a member of the Canadian Medical Association, the Maritime Medical Association, and the Prince Edward Island Medical Association, in all of which he held official positions. He was also a Free



DR. DANIEL ROLSTON DUNLOP

when he became a member of the staff of the Colonel Belcher Military Hospital.

To those who were privileged to have his friendship he will ever be remembered as being staunch and true. He was a man of strong personality, and of great determination, yet of a very kindly disposition and always at the service of patients and friends. He early became a prominent member of the Calgary Medical Society and only a week before he was so suddenly stricken he read an admirable paper on "The Life and Work of Louis Pasteur," which appears, somewhat abridged, in the present issue of the *Journal*.

Dr. Dunlop took a keen interest in civic affairs, and was in every way a public-spirited citizen, always giving of his time and energy when the public weal was at stake. He was a fluent and a convincing speaker.

and Accepted Mason, and member of the Independent Order of Foresters.

In every walk of life he exemplified the highest type of citizenship. He was a man of splendid appearance, distinguished in this respect above the average. His personality was in harmony with his magnificent physique, and his geniality, friendliness, and sociability made him beloved by all who knew him, regardless of class, creed, or politics. He was a fitting representative of a distinguished family, many of whom have become famous in the history of our Empire.

On July 12, 1887, he married Miss Louise Margaretta Hobkirk of Charlottetown, a daughter of the late Dr. Hobkirk, a leading physician of the city. His wife predeceased him by some fifteen years. There

To many, who have since those early days passed along, he was ever their great help in sickness and in health. He never refused a call to the poor and needy. His popularity amongst all classes is shown, inasmuch as he held the chair of Chief Magistrate of his adopted city for three years, and also represented the city in the Provincial Legislation for two terms. He gave of his best to the improvement of the province and city, and was ever a faithful servant of the people.

To his more intimate friends and confrères, he was known as "Jim." He was a man who was highly appreciated by them. Among his confrères he was considered the soul of honour, and he was ever ready to help and give of his advice.

The day before he left to go to Montreal, at the advice of his many medical friends, he operated on an old patient of his, at which operation the writer assisted him. To look at him then one could hardly conceive that in so short a time he was to leave us forever.

During the years I have known him (considerably over 40) we were always friends professionally and socially. Though a strong political partizan, opposed to one another as we were, it never interfered with our friendship.

May he rest in peace and may his good works follow him."

**Dr. James Algie**, well known in the psychiatric circles of the province, died in Florida in January in his seventy-second year. In addition to his interests in medicine and psychiatry, Dr. Algie was a student of philosophy and literature to an extraordinary degree, and had contributed two publications, "Houses of Brass" and "Bergen Worth" to the realms of general literature. Born in Ayr, he graduated at Trinity University, and practised medicine in Peel County for many years. Twenty years ago he joined the staff of the Queen Street Asylum and was later physician in charge of the Mercer Reformatory.

**Dr. Charles R. Dudderidge**, of Winnipeg, died suddenly at Victoria, B.C., on February 11, 1928. With his wife and daughter he had been in Southern California, and was on his way home, when he was stricken with pneumonia. Dr. Dudderidge was born at Lachute, Quebec, and came to Winnipeg as a boy. He was educated in the public schools, Manitoba College, McGill and Manitoba Universities, where he graduated in 1906, winning the O'Donnell Medal in Obstetrics. In his college days he was a noted hockey player. He practised at Snowflake, Man., and Franklin for a few years then returned to Winnipeg, where he was in practice for about twenty years. In professional life he secured a very large practice and was greatly esteemed both by his patients and medical brethren. He leaves a widow, and a daughter by his first wife. He was buried in Winnipeg.

**Dr. Alfred J. Horsey** died in Ottawa on February 3rd, aged 85 years. Probably the oldest physician in the Ottawa district, Dr. Horsey was born in Kingston in 1843, and graduated at Queen's in 1885. He was particularly well known in connection with the Militia Service of Canada, having served in the second Riel Rebellion with the Midland Battalion, and having been for eighteen years surgeon of the Governor-General's Footguards.

**Dr. David Jamieson**, a retired medical man, formerly of Woodland, Ontario, who had been residing in Montreal for the past few years, died on January 24th in his seventy-fifth year. Dr. Jamieson was well known in Ontario, where he had lived until a few years ago, when he retired and took up residence in this city.



DR. JAMES WARBURTON

are left to mourn one daughter, Mrs. A. E. (Helen M.) Blackmore, Montreal; two sons, Erie, in Vancouver, B.C., and Arthur, La Tuque, Quebec, (the latter being with his father during his last illness); also two brothers, Dr. George, Victoria, B.C., and the Hon. A. B. Warburton, Judge of Probate, Charlottetown; and one sister Mrs. Robert Bruce Stewart, Strathgartney.

The funeral service took place on February 14th at St. Paul's Anglican Church and was attended by the Lieut.-Governor, the Premier, the Mayor and Council, the Police and Fire Departments, and many citizens from all walks of life.

Dr. S. R. Jenkins, President-elect of the Canadian Medicine Association, has been good enough to send the following personal appreciation:—

"Dr. Jim has passed away, such was the sad news that spread rapidly through Charlottetown on Thursday evening last, a great sorrow to the citizens where he was so well and favourably known.

Those of us who knew Dr. James Warburton during his long career in the practice of medicine, which dated back to the early 80's, at that time a young man starting his profession in Charlottetown, whilst the writer was still a student, knew him as a true friend and gentleman.

**Dr. H. C. Kindred** of Tweed, Ontario, a graduate of Trinity in 1905, died on February 10th. A most successful medical practitioner, he had been as well Warden of Peterboro and Reeve of Tweed. An enthusiastic Mason and Oddfellow, he also took great interest in church work at Havelock and Tweed, and was leader of the choir and an elder in the Tweed United Church.

**Dr. Malcolm E. Mackay.** Born August 9, 1876, the late Dr. Mackay died after a short illness on January 25, 1923, from general sepsis following Ludwig's angina.

Though feeling somewhat indisposed he had been carrying on as usual his surgical practice up till January 21st when he was himself taken suddenly very ill and despite every effort to save his life he rapidly succumbed to the deadly infection.

The terrible suddenness of his passing came as a great shock, not only to the medical profession, but to the whole community. Probably no physician ever enjoyed to a greater degree the respect and esteem of the public, or had a larger circle of intimate friends than the late Dr. Mackay. His genial and cheerful disposition, his well known consideration for and generosity to the poor and unfortunate, his reputation as a skilful surgeon brought together on the day of his funeral from city and country the largest concourse of mourning friends ever seen in the city of Edmonton. The service held in the First Presbyterian Church of which the deceased was an ardent supporter and member, was largely attended, multitudes being unable to gain admission.

The late Dr. Mackay was a native of Nova Scotia. Previous to taking up medicine he taught school in western Canada for three years. He went to McGill University in 1901 and graduated in 1905. He commenced general practice at Paynton, Saskatchewan, where he remained till 1912, when he took post-graduate work in London and Edinburgh and secured the diploma of F.R.C.S. Coming to Edmonton in 1914, he rapidly achieved success and distinction as a prominent surgeon. He was elected a Fellow of the American College of Physicians and again took post-graduate training in Austria in 1925 and 1927.

A member of a large family, his parents surviving him, he leaves in Edmonton to mourn his loss a widow and one son aged 19, a student of Arts and Medicine, Alberta University and one brother Dr. W. A. Mackay with whom he was associated in practice.

**Dr. O. Mazuret** died on January 27th at the age of 73 years. Dr. Mazuret was born at Baie D'Urfé in 1855, and educated at the seminary at Nicolet. In 1874 he received the degree of Doctor of Medicine from Laval University, and after practising many years in

L'Avenir came to Montreal in 1905. He was unmarried.

**Dr. George M. Robertson.** We regret to have to record the death of Dr. George M. Robertson, a graduate of the Marion Sims Medical College and for the past twenty-two years a resident of Nanton and latterly of Calgary.

**Dr. Robert Norman Shaw,** a graduate of the University of Toronto in 1906, died at the Grande Prairie Hospital, Peace River District, on December 4, 1927, from septicemia, after an illness of about eight days' duration. He was forty-seven years of age.

After registering in the Province of Ontario in 1907 he spent some time at the New York Post-Graduate Medical School and Hospital.

He came to Alberta in 1914, settling at Grande Prairie and later at Sexsmith, where he practised until the time of his last illness.

**Sir Dyce Duckworth** died at his London residence, at the age of 87. From 1890 to 1901 he was Honorary Physician to King Edward VII, when Prince of Wales. In 1886 he received the honour of knighthood, and in 1909 he was created a baronet.

Duckworth devoted his attention more especially to gout and rheumatic affections of the joints. He was a good example in modern times of the old courtly physician, somewhat formal in manner, soft-spoken, rather slow, but easily kindled to wrath, for he did not suffer fools gladly. He was a transparently honest, and excellent teacher, and a sound consultant.

**Max Gruber,** successor of Pettenkoffer as head of the Institute of Hygiene at Munich, died recently. He, almost simultaneously with Widal, Durham, and Grünbaum, described the phenomenon of agglutination of typhoid bacilli with specific serum, and clearly stated its diagnostic significance.

**Prof. Dr. Johannes Fibiger,** of the University of Copenhagen, died in the early days of February, aged about sixty years. He became internationally famous for his pioneer researches into the etiology of cancer in rats, and its association with a parasite found in cockroaches. In fact, he was the first to produce cancer experimentally beyond all possibility of doubt. His work, not only in what it accomplished, but also by its inspiration, was the greatest contribution to experimental medicine in this generation. To great scientific distinction he added all the charm of a singularly straightforward and modest character. Withal he was an excellent teacher. He was the recipient of the Nobel Prize in 1926.

## News Items

### GREAT BRITAIN

Sir Dawson Williams has relinquished the editorship of the *British Medical Journal*, and is succeeded by Dr. Norman Gerald Horner. Dr. Horner was educated at Tonbridge School, Gonville and Caius College, Cambridge, and at St. Bartholomew's Hospital. He was for a time assistant editor of the *Lancet* before joining the *British Medical Journal* as assistant editor. He has been connected with the latter for more than ten years.

The British Red Cross Society has decided to establish clinics for the treatment of rheumatism in adult sufferers in thickly populated centres throughout the

country. The first of the clinics will be established in London. It will be under the administrative authority of a committee of management set up by the Society, to which members representing the medical profession and industrial organization will be co-opted. The clinic is intended for the benefit and relief of rheumatic persons, who are able and willing to pay a reasonable fee for treatment, and for the industrial worker who can receive treatment while continuing his occupation in the usual way.

A clinic for providing dental treatment for children

and for nursing and expectant mothers is to be built on a site adjoining the Royal Free Hospital, London. The clinic is the gift of Mr. George Eastman, of the Kodak Company, Rochester, N.Y., U.S.A.

The King has conferred the rank of Honorary Knight Commander of St. Michael and St. George on Dr. Aldo Castellani, Director of Tropical Medicine at the Ross Institute and Hospital for Tropical Diseases at Putney Heath. Dr. Castellani is at present in the United States. He has been lecturing at Tulane University, New Orleans.

The King has approved of the appointment of Brevet Colonel W. R. P. Goodwin, R.A.M.C., D.S.O., as Honorary Physician to the King, in succession to Major-General S. F. St.D. Green M.D., C.B., C.B.E., who has retired.

The diploma of Honorary Associate has been conferred on Sir John McFadyean, B.Sc., M.B., C.M., M.R.C.V.S., LL.D., by the Royal College of Veterinary Surgeons, London. Sir John is the late Principal and Dean of the College. This is the highest honour the

council can bestow, and has been conferred on only one other British veterinary surgeon.

The London Hospital has just received a grant of Arms from the College of Heralds. The design in heraldic language, is, quarterly argent and gules, a cross couped countercharged on a chief azure, three feathers erect quilled or. The three feathers in the cognizance have reference to the origin of the hospital, which was organized on September 3, 1740, at the Feathers Tavern, Cheapside. On that occasion, Mr. Harrison, surgeon, reported that he had taken a lease of a house in Featherstone Street, for five years, at a rental of £16 per annum. It was decided to open the building as an infirmary so soon as £100 should be subscribed. The original resident staff consisted of a man and his wife, who were paid £20 a year. Two gentlemen were appointed to equip the building at a cost which was not to exceed £15. Compare this with the latest gift of Mr. Bernhard Baron of £35,000, to build and equip the Institute of Pathology at the London Hospital, which was formally opened by Sir Humphry Rolleston quite recently.

## GENERAL

### CIVIL SERVICE POSITIONS

The Civil Service Commission of Canada has announced an open competitive examination for:

Medical Officers Grade 1 (Overseas), (5 vacancies), in the Department of Health, European Service, at an initial salary of \$3,000 per annum, which will be increased upon recommendation for efficient service at the rate of \$120 per annum until a maximum of \$3,480 per annum has been reached. In addition to the above, there will be an annual living allowance of \$660. Transportation will be provided at Government expense from port of departure in Canada to London, England, and thence to post assigned. Successful applicants may be assigned to duty at or transferred to any station at the discretion of the Department.

The duties demanded will be to perform medical work or medical inspectional work in connection with prospective emigrants for Canada in Great Britain, Ireland, and on the Continent of Europe, in connection with the activities of the Department.

A Chemist (Bacteriologist), (Male), for the Laboratory of Hygiene Division, Department of Health, Ottawa, at an initial salary of \$2,820 per annum, which will be increased upon recommendation for efficient service at the rate of \$120 per annum, until a maximum of \$3,300 has been reached. The duties demanded will be to carry out all fundamental bacteriological procedures; to perform water and milk analyses according to accepted technique; to make bacterial vaccines; to carry out the technique of complement fixation procedures; to evaluate toxins and antitoxins in a practical manner by recognized methods, and to perform any other cognate duties as called upon.

The qualifications required will be graduation from a university of recognized standing in either medicine or science, together with at least two years post-graduate laboratory experience in bacteriological and serological work, preferably in a public or private institution conducting serological investigations.

### GENERAL DIRECTIONS

Application forms properly filed with the Civil Service Commission, Ottawa, *not later than March 1, 1928*. Application forms may be obtained from the offices of the Employment Service of Canada, from the

Postmasters at Prince Rupert, Vancouver, Victoria, Edmonton, Calgary, Regina, Saskatoon, Winnipeg, Quebec, Fredericton, St. John, Charlottetown, and Halifax, or from the Secretary of the Civil Service Commission.

By Order of the Commission,

W. FORAN,  
*Secretary*

*It is a matter of regret that notice of these positions was not supplied to us in time to publish it in an earlier issue.—(Ed.)*

The *Nova Scotia Medical Bulletin* for January publishes two interesting letters from Drs. Wickwire and Kelly, both graduates of Dalhousie, who have been associated with the Hudson Straits Expedition. The following extracts give some idea of the living conditions of the Esquimaux.

"There were no Esquimaux on the Island when we came here, but some six men and five women with 15 children arrived in their small sail boat. Though to us they seem dirty and smell powerfully of the seal, yet you cannot help liking them. They will gladly do anything for you, with little or no remuneration.

At present they are living in canvas tents on the shore of our cove. A large part of the summer months they live on their little boat. The unsanitary habits and cramped living room, especially on the boat, seem to me awful. In a space probably with a volume of 500 cubic feet they commonly pack 20-30 people. One towel for the family, often a bird skin. Common drinking cup, common gum, is the custom.

They come to me for treatment. Unfortunately, out of this small group, I have found 2 cases of tuberculosis of the lungs, a third, a child about six years of age, with tuberculosis of the hip.

There haven't been any obstetrical cases here yet—there was one, but the natives never bother the doctor about trivialities like that, and forty-eight hours later the young mother journeyed about a mile and a half over the rocks, with the infant on her back to visit friends and relatives.

Up at Wakeham Bay they had an epidemic of "Intestinal Flu" that carried off six of the young

children and nearly finished one of the construction gang, but we have escaped anything like that so far."

The Eleventh Annual Convention of the Association

of Officers of the Medical Services of Canada is to be held in Ottawa, Friday and Saturday, April 13th and 14th, at the Chateau Laurier. Special business and social programmes are being arranged for. All ex-service medical officers are urged to attend.

## NEWFOUNDLAND

The annual meeting of the Newfoundland Medical Association will be held at St. John's from June 25th to 30th. President: Dr. A. R. Anderson, of Heart's Content. Secretary: Dr. John Grieve, St. John's. As this meeting is held so soon after the gathering of the Canadian Medical Association at Charlottetown, it is

hoped that many of our Newfoundland confrères will be able to attend there, and then persuade the Canadians to return with them to the island Dominion. There is here a splendid opportunity to demonstrate the solidarity of the profession, and at the same time enjoy a delightful holiday under favourable auspices.

## NOVA SCOTIA\*

Dr. Clyde S. Marshall, of Halifax, Provincial Psychiatrist, delivered an interesting lecture at the Dalhousie University Health Centre, on January 9, 1928. His subject was "Mental Hygiene in Nova Scotia." He illustrated his remarks by the citation of cases illustrating the importance of proper home and school training and environment.

On December 28th, the Rev. W. J. Alexander, on behalf of a large number of friends assembled in the Oddfellows' Hall, Goldboro, read an address to Dr. J. J. McRitchie, and presented him with a fine buffalo coat. At the same time, Mrs. McRitchie was presented with a purse of money. This pleasing incident is proof of the high regard in which Dr. and Mrs. McRitchie are held by the community.

One of the most interesting addresses delivered for some time was that given on January 18th, to the Halifax Medical Society by Dr. Ross Millar of Amherst. His subject was "Japanese hospitals."

The award of an All-Canada Rhodes Scholarship has been made to J. Hugh MacLellan, son of Dr. S. J. MacLellan of Halifax. Mr. MacLellan is a graduate of the Halifax Academy, and will graduate this year from Dalhousie University with Honours in Classics. He is president of his class, and a member of the Students' Council. In athletics he excels in basket-ball and tennis, and has been identified with many undergraduate activities. Dr. MacLellan, himself a classical scholar of note, has evidently imparted some of his love for the humanities to his talented son.

Members of the profession throughout the Dominion will regret to learn of the illness of Dr. W. H. Hattie,

\* Owing to the illness of Dr. Hattie we are indebted to the Editor of the *Nova Scotia Bulletin* for our Nova Scotia News Items.

Assistant Dean and Professor of Hygiene in the medical faculty of Dalhousie University. He is at the time of writing confined to his home by an attack of acute inflammatory rheumatism. We are glad to learn that he is showing signs of improvement. Dr. Hattie is a valued contributor to the pages of this *Journal*.

The officers of the Rockefeller Foundation, who have been greatly interested in the work of the Public Health Centre of Dalhousie University, have announced the grant of \$5,000 for each of two years to provide additional teaching staff in the department of hygiene. This further proof of the generous attitude of the Foundation toward the medical school is deeply appreciated by all concerned with the problem of medical teaching.

The Misses McCulloch, of Truro, have continued their series of gifts to Dalhousie University by the presentation of a collection of wild flowers of Nova Scotia, prepared by the Rev. Dr. Thomas McCulloch, and also his Diploma of Foreign Membership in the Wernerian Natural History Society of Edinburgh. Dr. McCulloch was President of the university from 1838 to 1843.

The recent outbreak of typhoid fever in Stellarton again calls attention to the necessity of constant and careful supervision of all community water-supplies. The supply in this case was a river. An unusual rainfall swept infected material into the water, which was unprotected by filtration or chlorination. Temporary chlorination was at once arranged for, and no new cases have been reported for some time.

Dr. Phillip McLaren has been appointed Assistant Physician to the Victoria General Hospital, Halifax, and Dr. M. G. Burris as Assistant Surgeon in the same institution.

## PRINCE EDWARD ISLAND

Dr. V. L. Goodwill, Medical Superintendent of the Falconwood Hospital, Charlottetown, retired from this position at the end of last year. He had handed in his resignation in April, but, owing to difficulties in securing a successor, he agreed to remain longer. He will be

greatly missed by the patients, staff, and general public alike. Dr. Goodwill intends to take up private practice in Charlottetown, specializing in nervous diseases. Dr. J. W. McIntyre has been appointed to his place in the hospital.

## NEW BRUNSWICK

Dr. Mabel Hannington, of Saint John, is at present attending the meeting of the National Council of Mental Hygiene in Toronto.

The death occurred on February 14, 1928, of Mr. Henry J. Pratt of Saint John. Dr. Charles Pratt is a son.

On February 13th, the Commissioners of the Jordan Memorial Sanitarium formally took possession of the new building at River Glade. Those present at the meeting included, Senator C. W. Robertson, Hon. James A. Murray, Mr. A. E. Trites, Capt. J. W. Carter, and Dr. R. J. Collins. There are now ninety patients in the institution. Twenty new patients have been admitted since the addition was completed.

The Board of Health in the City of Saint John, in a recent announcement, placed the infant mortality rate in Saint John at 88.7 for every 1,000 births. These figures show a marked improvement. A great deal of

credit for this is to be given to the pre-natal clinics at the Health Centre.

Dr. C. M. Kelly is again able to attend to his practice and it is reported that his eye-condition is much improved.

Dr. G. A. B. Addy has been appointed as a commissioner for the General Public Hospital, Saint John. Dr. Addy is at present spending some time in the southern United States.

The comparatively open winter, with a very small snow fall, has allowed the quite general use of motor vehicles throughout the province. This has been, particularly, a convenience to the rural physician, who ordinarily has to depend upon horse-drawn vehicles during our winter. A local physician last Sunday completed a hundred mile trip on the ice of the Saint John River, and reported a marked lack of highway congestion during the trip. A. STANLEY KIRKLAND

## QUEBEC

Announcement has been made of a yearly gift of \$1,200 to the Faculty of Medicine of McGill University for the next three years, for research in obstetrics and gynaecology. The gift comes from Mrs. J. R. Fraser, and was accepted at a recent meeting of the Medical Faculty. It will be devoted, as indicated by the donor, to the enlargement of research in the Departments of Obstetrics and Gynaecology in the faculty.

The Faculty acknowledge also a gift of \$100, which it is hoped will become an annual payment from a former professor to the Department of Pharmacology at McGill, to be applied to the purchase of special periodicals and material for research in this department.

The appointment of an Assistant Director of Public Health is expected, and a member of the medical profession has been approached by the city with an offer of the position. Dr. Anatole Plane, member of the Quebec Legislative Assembly, is stated to be the first selection made by the executive committee.

McGill University, the University of Montreal and the University of Laval, Quebec, are uniting in their efforts to promote the interests of industrial medicine. A number of doctors connected with industrial establishments, met and discussed the scope of such an organization. The following provisional officers were elected: Dr. A. R. Pennoyer, president; Dr. Harold Hibbert, head of the Department of Cellulose and Industrial Chemistry at McGill, and Dr. G. H. Hamel, vice-presidents; Professor F. G. Pedley, Secretary. A temporary executive committee of doctors was named, consisting of Dr. E. C. Feilde and Dr. Grant Fleming, with the power to add to their numbers. It was pointed out that a course in industrial medicine will be offered by McGill University to members of the profession, beginning about March 1st. It will consist of lectures and demonstrations on various phases of industrial medicine, from the scientific standpoint, as well as from those of its sociological relations, and the rehabilitation of employees who may suffer accidental or industrial injury. Field work in the industry and work at the industrial clinic of the Montreal General Hospital will be carried on. Both English- and French-speaking medical men attended the meeting, which was presided over by Dr. C. F. Martin.

International authorities on the care of the child are to speak in Montreal, as part of a course which has been arranged by the Canadian National Committee for Mental Hygiene in collaboration with McGill University. The course will be given in the Mount Royal Hotel, during February and March, and will be of such a nature as to clearly elucidate the important aspects of mental hygiene in childhood. "The public and the university student body will be interested to learn that McGill University, in collaboration with the Canadian National Committee for Mental Hygiene, is bringing to Montreal, beginning February 7th, a group of speakers of international reputation to discuss mental hygiene, its place in the guidance of children, and the prevention of nervous and mental disease," Dr. W. T. B. Mitchell, secretary of the committee, stated, when questioned concerning the course.

The *per capita per diem* cost of treating patients in the Brehmer Rest during the last year was \$1.22, it was shown in the report of the year 1927, which was read at the annual meeting. The medical report, submitted by the Medical Superintendent, showed that there were marked beneficial results in 89.7 per cent of the cases discharged. The number of hospital days spent by the patients was 4,616, a slight increase over last year. Thirty-nine patients were discharged during the year, five as remarkably improved, thirty as improved, and four as not improved.

The twofold aspect of the fight against cancer in Canada, that of awakening the public to a full realization of the amount of this disease in the community and of providing means for extensive scientific research, was emphasized at a meeting held at the invitation of the Faculty of Medicine of McGill University in Moyse Hall at McGill University. Dr. Gerster, chairman of the New York committee of the American Society for the Control of Cancer, addressed the meeting. The general trend of the discussion during the course of the evening indicated that an association which will be concerned both with educating the public and assisting research will be formed here in the near future, and that both the Universities of Montreal and of McGill will give every assistance to these endeavours. GEORGE HALL

## MANITOBA

The regular monthly meeting of the Winnipeg Medical Society was held on January 20th. Dr. E. J. Boardman spoke on "Diverticula of the urinary bladder," illustrating his remarks with a number of x-ray films. Drs. H. D. Morse and P. H. T. Thorlakson discussed the paper. Dr. G. W. Knipe gave an interesting talk on "As others see us," giving the views of a number of representative laymen on medical men. The following members were added: Drs. Novak, Finkelstein, Blanchard, Cleave, Sedziak, and Frank White (Associate).

The regular group-luncheon held on February 2nd at the Winnipeg General Hospital was of unusual interest. Dr. J. E. Lehmann presided in the absence of Dr. Harvey Smith, who, however, had sent a characteristic message from Bermuda. The following programme was presented: "Transposition of viscera, with congenital heart disease," Dr. Boyd. "Resection of the sensory root of the fifth nerve for tic douloureux," Dr. Gibson. "Normal variations in the number of the blood cells," Dr. D. Nicholson. "An unusual case of surgical tuberculosis," Dr. Brandson.

Dr. Waugh reported on the working of the diagnostic clinic at the Massachusetts General Hospital, Boston. After discussion, Dr. George Stephens and Dr. Waugh were appointed a committee, with power to add, to investigate still further the diagnostic clinic and report.

The following appointments to the Honorary Attending Staff of the Winnipeg General Hospital are announced: To be Assistant Physician to Out-patients (Medicine); Drs. A. W. Hogg, W. A. Murray, M. S. Hollenberg, H. D. Ketchen, A. S. McCann, W. S. Tisdale. To be Associate in Gynaecology; J. D. McQueen, M.D., F.A.C.S.

At the clinical luncheon held February 9th at St. Boniface Hospital the following programme was presented: "Myxedema," Dr. J. M. McEachern. "The heart in hyperthyroid disease," Dr. J. Brodie.

At a clinical luncheon held at Misericordia Hospital on February 14th, the following cases were presented and discussed: "Mesenteric thrombosis following suppurative cholangitis," "Spontaneous pneumothorax," and "Strangulated inguinal hernia, with post-operative obstruction."

Dr. D. C. Aikenhead gave an address at the Crescent United Church on February 12th, his subject being "Periodic health examinations." The lecture was given under the auspices of the Winnipeg Health League, which is the Manitoba representative of the Canadian Social Hygiene Council.

The Manitoba Hospital Association and the Manitoba Graduate Nurses Association held their annual meetings together in the Royal Alexandra Hotel, on January 25th and 26th.

A bill providing for old age pensions in this province will be introduced at the present session of the Manitoba Legislature.

The opening of the new nurses' home at St. Boniface Hospital has made it possible to provide nearly one hundred additional beds in that institution. Of this number, thirty are in the new maternity ward.

Sir Wilfrid T. Grenfell was the guest of honour at a luncheon in the Hudson's Bay Restaurant on February 20, tendered him by the Ministerial Association and the Winnipeg Medical Society.

A rink composed of Dr. Burns Walker, Dr. O. S. Waugh, Dr. F. G. Schwalm, and Dr. H. D. Kitchen took first place in the recent bonspiel of the Medical Curling Club with a record of ten wins and one loss. Rinks skipped by Drs. H. M. Speechly, W. W. Musgrave, and R. Black tied for second place, with seven wins and four losses.

ROSS MITCHELL

## SASKATCHEWAN

The regular meeting of the Regina Medical Society was held on February 1st, at 6.15 p.m., commencing with a dinner at the Kitchener Hotel. Dr. D. S. Johnstone presented a paper on "Osteitis Deformans," making particular reference to referred symptoms. A discussion followed; from the pathological aspect, lead by Dr. Challenger, pathologist Regina General Hospital; from the surgical aspect, lead by Dr. Beattie Martin; and from medical aspect, lead by Dr. E. K. Sauer. Dr. George, presented a clinical case of "Acromegaly."

Dr. J. A. O'Brien, formerly of Bladworth, is now practising at Dubue.

Dr. J. C. Finlayson, who formerly practised at Kinistino, has now opened an office at Prince Albert.

Dr. I. E. Brouse has moved from Vibank to Creelman.

Dr. M. H. McDonald, who was at Creelman, has started to practise at Griffin.

Dr. M. D. Baker has now opened an office at Hanley.

Dr. N. Hjalmarsson has moved to Lundar, Man.

Dr. E. J. Skafel has opened an office at Kamsack.

There are several good vacancies in this province at the present time.

## ALBERTA

The government reports that as a result of the last year's work with the tonsil and minor operation clinics, they are deluged with requests for an enlargement of the work and they have now in hand more requests than they can comply with. Not a single fatality resulted, and many needy cases were attended to, that by isolation or lack of the campaign of education undertaken by the government would not have been cared for.

The Council pointed out that the difficulty in manning rural fields with doctors, was being increased, that the confidence of the public was being undermined by the apparent conclusion that the members of the travelling clinics were of superior mould to the resident physicians who rendered twenty-four hour service, and at all times cared for the sick regardless of the

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possibility of ever collecting expenses, let alone fees for services in many cases.

Complaint was registered that while all parties to the travelling clinics were advised well ahead of the arrival, it remained for the doctor alone, to be notified only on the morning of arrival, when a measure of co-operation was asked him.

The government promised to consider the question as to the best means of rendering assistance to those in need and at the same time get and give better co-operation.

At the February meeting of the Calgary Medical Society Professor F. H. Mewburn of the University of Alberta gave an interesting address on the "Life and Work of Dr. George A. Kennedy." Dr. Kennedy came to Alberta in the late "70's" and for a number of years was associated with the Northwest Mounted Police and subsequently for many years practised at Macleod. His name is linked with the early history of the practice of medicine in the Northwest Territories and in the Province of Alberta. He was one of the first presidents of the Alberta Medical Association and was held in very high esteem. He was a graduate of Toronto University.

Dr. E. L. Little, who formerly practised at Veteran, Alberta, has taken over the practice of Dr. Beavley at Grande Prairie in the Peace River District. Dr. Beavley is now practising at Spirit River.

Dr. J. R. Gamey has taken over the practice of the late Dr. R. Shaw at Sexsmith in the Peace River District.

Dr. Florence Murray, who has been acting as *locum tenens* for her brother at Athabasca during his illness, has returned to Halifax to complete her studies in radiology, prior to her departure for the Chosen (formerly Korea) mission field under the auspices of the United Church of Canada. Her brother, Dr. Foster Murray, has now fully recovered and has resumed practice.

Dr. H. C. Swartzlander of Oyen and his partner Dr. W. D. McPhail have dissolved partnership. Both of these physicians will remain in practice at Oyen.

Dr. D. McCullough of the Provincial Mental Hospital at Ponoka has left for Cambridge, England, where he will take a year's post-graduate work in medical psychology.

G. E. LEARMONT

## BRITISH COLUMBIA

On January 10th the members of the Fraser Valley Medical Society were entertained by Dr. J. G. McKay at Hollywood Sanitarium, where dinner was served, and an excellent address on "The common psychoses met with in general practice" was given by Dr. McKay. A class is being formed amongst the members of the Society for the study of advances in medicine, to meet weekly and discuss different subjects. Dr. G. W. Sinclair, of New Westminster, assisted by Dr. Matheson, showed an interesting group of cases on the evening of January 24th, illustrating the different anaemias. A case of hereditary luetic infection in a child 10 years old, simulating haemolytic jaundice, with the usual periodic attacks of haematuria, opened up the field for an interesting discussion.

The December meeting of the Victoria Medical Society was held in the Library Rooms and was very largely attended. On this occasion, Dr. Chas. E. Sears and Dr. Karl H. Martzloff, both of Portland, Oregon, were the speakers. Dr. Sears dealt in a very full and interesting way with the spleen and Dr. Martzloff presented a paper covering work done on cancer of the cervix. This proved to be an unusually excellent evening, and the Society adjourned until 1928.

The Victoria Medical Society held a dinner on December 20th, at the Empress Hotel, Victoria, when forty-eight medical men filled to capacity the private dining-room. The Hon. Dr. W. H. Sutherland, Minister of Public Works, spoke briefly in happy vein. Dr. S. L. Milne was introduced, and the President, Dr. M. W. Thomas, recalled that Dr. Milne was the President of the Society thirty-two years ago, and had at that annual meeting read a paper entitled "Experiences in fifteen years of medical practice." Dr. Milne was warmly received, and the members were keenly interested in his description of the visit of Lord Lister to Victoria, and of the nature of the welcome by the then small group to this celebrity. Singing was lead by Dr. H. M. Robertson, who also favoured with a piano selection and some new songs. Dr. Robertson still retains the premier position as the talented entertainer of the Medical Society. The programme was much enlivened by the brief speeches of Drs. Forrest Leeder, George Hall, J. W. Lennox, Thomas McPherson, A. E. McMicking, Alan Fraser, and

Lt.-Col. W. H. K. Anderson. Drs. Campbell Davidson, of Qualicum, and George Bissett, of Trail, B.C., who were visitors, added the odd song and a word of greeting. Drs. E. L. Garner and H. P. Swan, of Duncan, motored down for the dinner. The Victoria medical profession often meets at dinners and luncheons, and these social features have become very popular.

The January meeting of the Society was held at the Royal Jubilee Hospital, Victoria. Dr. D. E. H. Cleveland, of Vancouver, who is specializing in dermatology in that centre, addressed the Society dealing with "Acne vulgaris and dermatitis venenata," stressing particularly the newer developments in treatment. A lively discussion followed, and Dr. Cleveland answered questions which covered a large field of dermatological conditions.

Dr. M. J. Keys, of Victoria, and Dr. L. H. Leeson, of Vancouver, who had just returned from Europe, told of conditions on the continent and of the post-graduate programme as carried on at various centres but with special attention to Vienna and the arrangements and opportunities for study at that Mecca. Dr. Keys and Leeson were both interested particularly in their specialities of eye, ear, nose and throat. Dr. Leeson endorsed Dr. Keys' praise of the comfort of the air-line from Paris to London. A vote of thanks was passed to Drs. Cleveland, Keys and Leeson, for a most interesting and instructive meeting.

The January clinical meeting was arranged by the consultant staff of St. Joseph's Hospital, and was largely attended. Dr. A. E. Venables, of St. Paul, who was a visitor in Victoria, presented a paper on "The electro-cardiograph as an aid in diagnosis and a guide to prognosis and treatment." This proved to be most interesting to those present. Dr. Venables was warmly thanked for his instructive address. Dr. G. H. Aylward reviewed at length a clinical neurological case and was applauded for the careful preparations of the subject. Drs. Geo. Hall and J. H. Moore presented specimens and reports.

The committee in charge, Drs. T. McPherson, R. J. Miller and Alan Fraser, was thanked for a splendid programme.

The many friends of Dr. J. J. Gillis will be pleased to know that he has been elected Mayor of Merritt, B.C.,

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for 1928. Dr. Gillis has always taken a leading part in the development of the Nicola Valley.

We regret to report the sudden death on January 9th, of Dr. Henry Proctor Cox, late of North Vancouver. Dr. Cox was a popular member of the Dominion Quarantine and Immigration service, and prior to removing to Vancouver, some months ago, was assistant to Dr. C. P. Brown of the Williams Head Quarantine Station.

Dr. W. J. Knox, of Kelowna, B.C., left Vancouver on January 9th, to spend a few months in Florida, recuperating after his motor accident last summer.

A meeting of the Executive Committee of the

British Columbia Medical Association was held on January 27th, when much important business was transacted. Dr. H. E. Ridewood, President of the Association, was chairman, and the following out-of-town members attended: Drs. W. A. Clarke and S. C. McEwen of New Westminster, Drs. Thomas McPherson and H. E. Ridewood, of Victoria, Dr. McPhee of Nanaimo, Dr. E. L. Garner, of Duncan, and Dr. B. deF. Boyce of Kelowna.

The undermentioned were elected to membership in the British Columbia Medical Association: M. R. Basted, H. H. Boucher, H. G. Bruce, E. A. Campbell, W. A. Coburn, E. E. Day, W. L. Graham, W. H. Hatfield, J. M. Jackson, G. A. Lawson, A. B. Nash, H. M. Ross, J. E. Walker.

J. EWART CAMPBELL

## UNITED STATES

### THE CAMPAIGN AGAINST TUBERCULOSIS FOR 1928

The National Tuberculosis Association of America is planning a national campaign to interest the general public in the importance of the early diagnosis of tuberculosis. To supplement this general educational effort, they are drawing the attention of the profession to the work which has been done in establishing diagnostic standards for pulmonary and glandular (hilum) tuberculosis. A committee for the formulation of such diagnostic criteria was established as long ago as 1917, and has been continually at work. Their last publication was in 1926, and consisted of the seventh edition of their booklet entitled "Diagnostic Standards for Pulmonary and Glandular (Hilum) Tuberculosis."

In this booklet the signs and symptoms of early tuberculosis are dealt with and reduced to the simplest form possible, whilst described in accordance with the best teaching of the day. A classification of the type of disease according to the lesion is presented, with recommendations for the disposition of patients according to the stage in which the disease is met with. It may be obtained free of charge on application to the National Tuberculosis Association, 370 Seventh Avenue, New York City.

On May 4, 1927, the distinguished and universally-known pathologist, Dr. William H. Welch, lately Director of the School of Hygiene and Public Health in Johns Hopkins University, and now Professor of the History of Medicine in the same institution, was the recipient of the Kober Medal of the Association of American Physicians for his numerous and important researches in scientific medicine.

The presentation was made by Dr. George M. Kober, Dean of the Medical School of Georgetown University, the generous and eminent creator of the Kober Foundation in that University. In his remarks, Dr. Kober traced the remarkable career of Professor Welch from his early days as a research student in Europe until the present, referring to his great influence as a teacher, and to his notable services in connection with public health and medical education, and paying eloquent

tribute to Professor Welch's versatility and charm of character.

Dr. Welch, in thanking the donors for the honour conferred upon him, told of his part in the foundation of the Association of American Physicians, and paid a graceful tribute both to his early teachers and his own pupils. He concluded by giving some good advice to young investigators. A sentence or two from his speech are worth quoting, as giving the opinion of a successful and experienced educationist: "It should be more widely realized that students in our American medical schools suffer from over-teaching. It is quite as important that educational and scientific institutions should learn how promising investigators may be and often are spoiled, and to protect them as their most precious asset, as it is to provide facilities for research."

A. G. NICHOLLS

The 13th Annual Convention of the Catholic Hospital Association of the United States and Canada and the Second Annual Hospital Clinical Congress of North America will be held in the Cincinnati Music Hall, Cincinnati, Ohio, June 18th to 22nd, inclusive, 1928. The Fourth Annual Convention of the International Guild of Nurses will be held at the same time, in the same building, at night meetings.

This Convention and Congress will be one of the largest and most important hospital meetings of the year, and will comprise general scientific meetings, special clinics or demonstrations of hospital departments, and three hundred special commercial and educational exhibits. Outstanding authorities in medicine, surgery, pathology, nursing, dietetics and hospital administration, architecture and engineering will lecture and demonstrate in specially planned clinics representing the various departments of the modern hospital. A professional programme of the highest interest and value is now being formulated, and all persons interested in medical and hospital service are cordially invited to attend. Further information may be obtained from John B. Hughes, M.D., Dean of the College of Hospital Administration, Marquette University, Milwaukee, Wisconsin, who is General Chairman of the Convention and Congress.

The Prince of Wales presided on December 13th at the distribution meeting of the General Council of King Edward's Hospital Fund for London. It was announced that the sum for distribution was £281,500, including a special grant of £34,500 from the Wells estate for schemes of extension and improvement.

Mr. Frederick L. Hoffman (*Monthly Bulletin*, Department of Health of the City of Boston) states that "sugar consumption in the United States is much above the average for many other countries, and the results of excessive consumption are apparently traceable in our higher death rate from diabetes." A. G. N.

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## Book Reviews

**Text-Book of Biochemistry.** A. T. Cameron, M.A., D.Sc., F.I.C., F.R.S.C., Professor of Biochemistry, Faculty of Medicine, University of Manitoba, Foreword by Professor Swale Vincent, LL.D., M.D., D.Sc., F.R.S.C. 461 pages, illustrated. Price 15/- J. & A. Churchill, London, W.1, 1928.

There is no more important subject in medicine at present than biochemistry. Indeed, our more striking advances in recent years have in large part come from this department, and we may look for even greater conquests in the near future. As Dr. Swale Vincent in his Foreword to this volume remarks, "biochemistry is no longer merely the handmaiden of physiology." It has its own independent teachers, its institutes, and, of course, its text-books.

The present volume, which its author modestly refers to as a little one, is intended for students of medicine and science. The scope of the work is wider than is usual in such text-books. Chapters on the chemistry of immunology, the utilization of biochemical processes in industry, and the biochemical aspects of pharmacology, are added in smaller print at the end of the book and greatly enhance its value. It follows that to cover the subject in the compass of some four hundred pages there must be considerable concentration. We think, however, that the author has successfully avoided the danger of uninspiring brevity, and has exercised an admirable discretion in adjudicating on what is essential.

We are somewhat tempted to break a lance with Dr. Cameron when, in his preface, he rejoices over the fact that "students of Medicine and Science are wasting less and less time in the acquisition of a fragmentary knowledge of the dead languages." We entirely agree with him as to the undesirable state of scientific nomenclature, with its cryptic terms, often hybrids, derived from these same dead tongues, but we think that if the coiners had themselves had more tuition in these languages the results might be more happy. No doubt it is desirable that our nomenclature should be logical and intelligible, but whether it should be English is another matter. After all much scientific work is published in other languages, so that a nomenclature understandable by every race becomes a necessity.

But such criticism is really *ultra vires*. For the book itself we have nothing but the warmest commendation. It is lucidly and attractively written, the printing is clear, and the illustrations excellent. We feel sure that the student will welcome a volume that he can handle with ease and read while in a recumbent posture. So many of our text-books nowadays require to be laid upon a good solid table. We cordially welcome this product of the young, growing, and already distinguished Medical School of the University of Manitoba, and we congratulate the author heartily upon a piece of work well done.

JAMES MILLER

**Surgical Diseases of the Gall Bladder, Liver and Pancreas, and Their Treatment.** Moses Behrend, A.M., M.D., F.A.C.S. 278 pages; illustrated. Price \$4.50. F. A. Davis Co., Philadelphia, 1927.

The author of this work has been successful in presenting in concise form a very readable and valuable addition to the literature of gall bladder, liver, and pancreatic diseases. The opening chapter deals with the development of these organs and makes an excellent introductory to the two succeeding ones which describe the anatomy of the liver and pancreas, together with their ducts and blood vessels. Anomalies of the latter structures are specially dealt with, and

are made clear to the reader by a series of very excellent plates and drawings accompanying the text. Some twenty-five such variations have been found in the dissecting room and many of them demonstrated at time of operation by the author.

Chapter 4 treats clearly but briefly of the physiology of the organs under discussion, and is followed by an equally condensed description of their pathology. Infection by the haemogenous route is considered by the author to be probably the most frequent of the various avenues of ingress.

The symptoms, diagnosis and differential diagnosis are next set forth in an orderly manner. Given an opportunity of seeing the patient in an attack, together with the description of symptoms by the patient, and with the history, a diagnosis of cholelithiasis can be made in the majority of cases without resorting to an x-ray examination. In cases, however, where the symptoms are not clear cut, or where other diseases of the gastro-intestinal tract must be eliminated, the x-ray examination is most important. The preparation of the patient for cholecystography, by the Graham or other methods, is clearly described, whether the dye is administered intravenously or by mouth.

In discussing the treatment of gall bladder disease, the importance of pre-operative preparation is stressed. The necessity of a blood urea, nitrogen, and sugar estimation is pointed out, as is also the use of the Fowler position, and the giving of large quantities of water by the Murphy method preparatory to operation. The author has a decided preference for nitrous oxide gas and oxygen as the anaesthetic, and rarely uses any other.

Medical treatment of gall bladder diseases he dismisses in few words, as in his opinion it is a failure. Cholecystectomy is the operation of choice, according to the dictum "Once the gall bladder has been infected, it is always infected." Indications for cholecystostomy or external drainage are few, and when permanent drainage of the gall bladder is necessary, an anastomosis of this organ with the stomach or duodenum affords the patient all the relief possible, without the disagreeable presence of a fistula.

The "open method" is strongly advocated in doing cholecystectomy. By this, the right free border of the gastrohepatic omentum is incised and the ducts and blood-vessels are exposed to view. The cystic duct is always separated from its bed before ligation, and its insertion into the common duct is noted. The site of ligation is close to the common duct, and silk or linen is preferred to catgut. The cystic artery is always ligated close to the gall bladder, and catgut is the choice here. The gall bladder is then stripped from its bed from below upwards, and the bed sutured with a continuous mattress suture.

Succeeding chapters deal with cholelithiasis and operations for its relief; complications following "cholecystectomy"; injuries to the liver; pancreatic diseases and their treatment; and lastly the results of ligating the hepatic artery are discussed in a most interesting manner.

Those interested in abdominal surgery will find both interesting and profitable reading in this book.

A. S. MONRO

**An Introductory Course in Ophthalmic Optics.** Alfred Cowan, M.D., Assistant Professor of Ophthalmology in the Graduate School of Medicine, University of Pennsylvania. 262 pages, 121 illustrations. Price \$4.00. F. A. Davis Co., Philadelphia, 1927.

To the rank and file of ophthalmologists and students in ophthalmology few subjects have been more

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unsatisfactory than the optics of their special branch of medicine. It is either discussed in treatises containing a degree of mathematics which is beyond them, or is "simplified" by the mere statement of a succession of undemonstrated conclusions.

To teach science which depends largely on trigonometry to those who have forgotten most of the small amount of trigonometry they once knew is a very difficult task. But Cowan, in his teaching of post-graduate students, has learned both the difficulties and the way to meet them, and he has succeeded exceedingly well in producing a book which combines explanation with simplicity. He has freely used the methods of his classroom and laboratory, with a particularly satisfying result. In most cases, his mathematical proof of optical laws is easy to understand, and, when higher mathematics is unavoidable, illustrative experiments bring satisfactory conviction to the less advanced student.

The chapters into which the book is divided are headed (1) Introduction. (2) Reflection at Plane Surfaces. (3) Refraction at Plane Surfaces. (4) Reflection at Spherical Surfaces. (5) Refraction by a Spherical Surface. (6) Lenses. (7) Dioptric System of the Eye. (8) Myopia. (9) Hyperopia. (10) Astigmatism. (11) Accommodation. (12) Aperture of the System. Diffusion Images. (13) Ophthalmoscopy. Retinoscopy.

Large, clear print, carefully drawn illustrations, and a good quality of paper, add to the excellence of the volume.

Those who wish merely to clarify their clinical experience in optics should give this book a welcome, while those who intend to dig deeply into advanced treatises, such as those of Helmholtz, Danders, Glazebrook, von Rohr, and Gullstrand, will find it a helpful introduction. It is a work which fills a real need in the literature of ophthalmic optics. G. S. RAMSAY

**Principles of Medical Treatment.** George Cheever Shattuck, M.D., A.M. Sixth edition, revised and enlarged. 256 pages. Harvard University Press, Cambridge, Mass., 1926.

An accessible text on the principles of treatment is always of assistance to those engaged in the practice of medicine, and particularly those, recently graduated, who may find themselves without any definite routine to be followed in the treatment of disease. For such and many others the present volume will have a distinct value. It presents a well thought out series of chapters by the editor and a group of contributors, each well qualified to deal with the branch he presents.

The subject matter may be divided into two general parts: the first, dealing with the principles of treatment of various diseases; and the second, a presentation of drugs, not grouped in the pharmacological manner, but rather in order of their usefulness in medicine.

There are chapters dealing with disorders of the circulation, nephritis, acute infectious diseases and acute infections of the respiratory tract; others in which the broad questions of treatment and prevention of tuberculosis and syphilis are presented; while special diseases, such as asthma and lead poisoning, are dealt with by Rackemann and Aub.

It is a pity that the section on anæmia should have been written so shortly before the advent of the use of liver in the treatment of pernicious anæmia. Reference to this development is relegated to a footnote.

There are also very conservative references to the endocrine disorders and the use of gland preparations, and also to vaccine therapy.

In the second section, (Chap. XVI) the arrangement of drugs in two groups, first, "Very Valuable Drugs", and second, "Useful Drugs", will assist in

keeping the feet of the potential wanderer close to the path of rational therapy.

There are a few insignificant errors in the proof such as "methol" for menthol on p. 71; 0.0016 min. is given as the equivalent of 0.01 c.c. on page 72, instead of 0.16 minim, "eisease", p. 103, and "staphylococcus arues" appears twice on pp. 202-3.

One might also take exception to the use of pituitrin in the treatment of distension in typhoid fever; but with these minor exceptions, the book should be a valuable one to house officers and young practitioners, for whom it is primarily intended. D. S. LEWIS

**Osler's Modern Medicine.** Vol. IV and V. Edited by Thomas McCrae, M.D. and others. Price \$9.00 each volume. Lea & Febiger, Philadelphia, 1927.

The fourth and fifth volumes of this system are now before us; the sixth and final volume is still to come. Volume IV is devoted to diseases of the respiratory and circulatory systems, and the contributors include some of the best known names in modern medicine.

The chapters on "Diseases of the Valves of the Heart," "Diseases of the Arteries," and "Aneurism" are those originally contributed by Sir William Osler, their revision having been very carefully carried out by Dr. Alexander Gibson of Edinburgh for the first-named chapter and by Dr. Campbell Howard of Montreal for the two latter.

Dr. Gibson also contributes chapters on "Hypertrophy of the Heart," and "Insufficiency and Dilatation." The useful plan has been followed of preceding the section on "Diseases of the Respiratory Tract" with a chapter on the "Physiology of Respiration," by Drs. George Norris and Thomas McMillan. The corresponding introduction to the section on "Diseases of the Circulatory System" has been dealt with by Dr. Charles Hoover, under "General Considerations in Cardiovascular Disease," in which he points out that the problem confronting the physician in a case of circulatory disease is—which of the many factors in the process of circulation is at fault?

Among other contributors to this volume are Dr. Maude E. Abbott, on "Congenital Heart Disease"; and Sir Thomas Lewis on "The Rate and Mechanism of the Heart Beat." Dr. H. S. Birkett writes on "Diseases of the Larynx"; Dr. Fred. T. Lord on "Diseases of the Pleura" and "Pneumothorax"; and Dr. H. A. Christian on "Diseases of the Mediastinum."

Volume V is devoted to the blood and lymphatic system, the ductless glands, the urinary system, the locomotor system, and vasomotor and trophic disorders. The section devoted to the latter is dealt with entirely by the papers contributed by Sir William Osler, revision and additions having been carried out by Dr. Archibald Malloch.

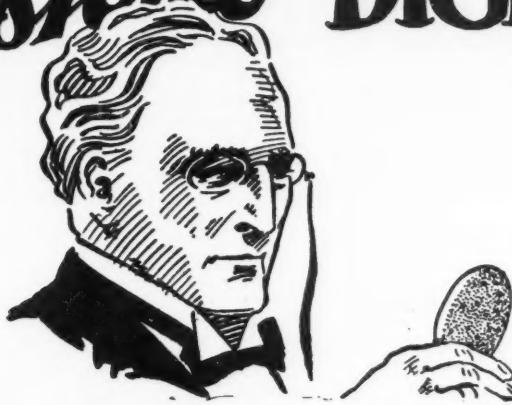
There is little to add to what has been said about this system in the reviews of previous volumes. The standard of excellence has been fully maintained, as is to be expected of the work of such contributors.

H. E. MACDERMOT

**Nutrition and Diet in Health and Disease.** James S. McLester, M.D., Professor of Medicine at the University of Alabama, Birmingham. 783 pages, charts. Price \$9.00. London and Philadelphia; W. B. Saunders Co. Toronto; McAinch and Co., 1927.

In this volume on nutrition and diet there is presented a discussion of the relation of these subjects to health and disease. The work is divided into two main parts; nutrition in health, and nutrition in disease. The first is subdivided into chapters which deal with metabolism, digestion, food requirements, a detailed discussion of food products, and normal dietary requirements, a detailed discussion of food products, and normal dietary requirements in infancy and adult life. The second part deals with diet in

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those diseases in which diet is of paramount importance, followed by those affections in which it is of less importance. In the first group are the deficiency diseases, diabetes, gout, obesity, leanness, food anaphylaxis, nephritis, and diseases of the digestive system. A third part presents standard tables of feeding methods, cooking, food values, standard portions, and formulæ used in estimating basal metabolism.

Pathological conditions and disturbance of function are fully discussed, and make clear to the student and physician the basis of determining a suitable diet. Wherever it seems desirable to outline a strict dietary, the reader is given a clear conception of the pathological condition to be met with, and the indications which should guide in the choice of food.

In his preface the author tells us that many oft-quoted regimens, which have the sanction of long tradition, have been omitted, because on critical scrutiny they have been found to have no value. Although in most diseases the desirable diet is carefully indicated, the frank discussion of how to meet the needs of the particular disease allows the physician to see the needs of the case, so he may modify the diet to meet the needs of the individual patient.

Many important advances have been made in the study of the chemistry of foods and digestion, which have an important bearing on diet in disease, while the rapidly increasing additions to our knowledge of metabolism and metabolic disturbances have necessitated the making of changes in the regimen of many conditions met with in the practice of medicine.

The physician who reads this work, to help him in the conduct of difficult cases, will find it free from fads and a helpful guide in practice. Well balanced and up-to-date, old and discarded methods have been deleted, making it a most desirable text and reference book.

J. H. ELLIOTT

**Physical Diagnosis.** Charles Phillips Emerson, A.B., M.D., Professor of Medicine, Indiana University School of Medicine. 553 pages, 324 illustrations. Price \$8.00. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1928.

It would be interesting to count up the number of books on physical diagnosis that are brought out each year, quite apart from the guidance to be derived from other text-books and miscellaneous writings. There is of course a need for such repeated writing on diagnosis, since refinements of methods and new ideas are continually being brought out, although one asks for something more than a simple catalogue of methods. Dr. Emerson hints however that his book has been written as a protest against the tendency to overestimate the value of laboratory methods in diagnosis. Laboratory and instrumental aids in diagnosis should never be allowed to replace physical diagnosis, nor even to disturb our conviction that the latter is the method which we should most rely on. But, if it embraces the things which we must do, we must also remember that every year sees an increasing number of things added to our storehouse of methods which we must not leave undone.

Here then is the problem of the writer of the book of diagnosis; he must give the first place to the physical methods, but he must find a place too for the laboratory aids. Dr. Emerson has taken up the physical methods alone, and has embodied the latest and best teaching from a great many sources. His illustrations are on the whole excellent. Photographs of cutaneous conditions however never convey very definite pictures, unless they are reproduced in colour.

The explanation of the pathological changes underlying clubbed fingers is perhaps a little too dogmatic, as it is not everyone who holds that the clubbing is due "solely" to a marked turgescence of the blood vessels of the finger tips. But this is only one instance of

debatable points, for which there is little room for discussion. The book is to be recommended as a clear and reliable guide for teachers and students alike.

H. E. MACDERMOT

**Dermatological Neuroses.** W. J. O'Donovan, of the Dermatological Department of the London Hospital. Price 2/6. Kegan Paul, London, 1927.

The author of this brochure on a very important subject is well qualified, and gives his opinion on the psychological factors in skin diseases. He details some of his experiences in a very extensive clinic, in which he met with some very puzzling conditions, such as dermatitis artefacta, alopecia areata, urticaria, pruritus ani and vulva, and the itching sensation, so called, and compares these with other functional diseases seen in other branches of medicine.

He does not share the pessimism of authors dealing with the neuroses applied to other specialties, such as the chronic abdomen, etc., but says that the queue of waiting cases of lichen, chronic urticaria, and of half-diagnosed cases of eczema, will be shortened if the emotional tone and psychological history of the patient are taken into account.

This little book can be read over in an evening and will give the studious medico some things worth while to think about.

W. D. JAFFREY

**Text-Book of Physiology.** William H. Howell, Ph.D., M.D., Sc.D., LL.D., Professor of Physiology in the School of Hygiene and Public Health, Johns Hopkins University, Baltimore. Tenth edition. 1081 pages, 308 illustrations. Price \$6.50. Philadelphia and London, W. B. Saunders Co.; Toronto, McAinsh and Co., 1927.

Writing text-books on physiology becomes increasingly difficult, since large numbers of new facts are published every year. These should be included in an up-to-date text-book, if it is to make an appeal to students and to teachers. Professor Howell is fully aware of this, and in his preface to the tenth edition writes: "In view of the great volume of experimental work upon physiology that is continually appearing in our journals, and the fact that special disciplines are required for a full comprehension of the advance along different lines, it is almost presumptuous for any one worker to attempt to give a presentation of the status of the whole subject." In spite of these difficulties, Professor Howell not only gives a clear account of the whole range of physiology, including recent advances, but he guides the student who wishes to do wider reading, by referring to the most important papers that should be consulted. Only too brief mention is made in very many instances of interesting developments. One regrets that so little space is devoted to internal secretions and vitamins and the autonomic nervous system. In these days, when guides to practical physiology are so numerous, illustrations and descriptions of apparatus might safely be left out of text-books, and the space devoted to discussion in greater detail of certain aspects of physiology. This book should prove popular not only with students and teachers, but also with medical practitioners who wish to keep in touch with physiology.

N. B. DREYER

**Organic Inheritance in Man.** F. A. E. Crew, M.D., D.Sc., Ph.D., Director of the Animal Breeding Research Department, Edinburgh University. 242 pages, illustrated. Price 12/6. Oliver and Boyd, Edinburgh, 1927.

This little book embodies the subject-matter of a course of lectures given in 1927 by its author at Birmingham University, in his capacity as the first William Withering Memorial lecturer. It is planned to give the medical profession, and, in particular, the general practitioner, an intelligible, but not too detailed, a presentation of the subject of heredity in man. Dr.

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A leaflet giving full particulars of the prize may be obtained from The Secretary, Royal London Ophthalmic Hospital (Moorfields Eye Hospital), London, E.C.1.



Crew is Lecturer in Genetics in the University of Edinburgh, and also the author of a well-known book on animal genetics.

The book begins, most appropriately, with a biographical sketch of William Withering, M.D., F.R.S., of Birmingham, distinguished as a botanist and clinician, and as the introducer of digitalis into medical practice. The introduction is taken up with a simple discussion of the problems involved in inheritance, among them the transmission of mental as well as physical characteristics, and the influence of environment on inherited qualities. Mendel's theory, relating to the distributive mechanism of organic inheritance, and his law, concerned with the independent assortment of factors, are considered in a straightforward way, and rendered more comprehensible by a free use of tables and charts. The physical basis of heredity is thoroughly and well discussed, and it is pointed out that modern views postulate that the heritable material is contained in the chromosomes of the nucleus. More than that, the hereditary factors—the so-called "genes"—are resident in, are borne upon, the chromosomes, and each gene has its own peculiar place upon a particular chromosome. Thus far, inheritance may be said to have been reduced to a mere matter of mechanics. It might, indeed, be reduced farther to the status of a problem in chemistry and physics, but Dr. Crew does not dwell at length on this aspect of the subject, though he touches on it in the chapter on the Nature of Genetic Action.

The mechanism of sex-determination is illuminatingly dealt with, and many instances are brought forward from the insect world to prove the now well-known fact that the phenotypic differences distinguishing male and female are associated with constant differences in the chromosome content of the tissues in the two sexes.

The important subject of consanguinity in matings is discussed and its relationship to pathological inheritances is emphasized.

The discussion and analysis of the basic principles involved in the subject of inheritance lead naturally to the consideration of normal and abnormal transmission in man, and a wealth of material is here brought together in a most interesting way. The appendix contains a large number of pedigrees of families afflicted with such striking anomalies as albinism, chondrodyostrophy, deaf-mutism, manie depressive insanity, myopia, and progressive muscular dystrophy, to mention but a few, which are impressive. Resistance to disease and natural immunity are dealt with, and also the highly important matter of the influence of heredity on tumour-formation.

The book is concluded with a suggestive chapter on the implications of genetic fact and theory.

Altogether, it may be said of this work that it brings together all the demonstrated facts relating to heredity, displays their bearings, and correlates them with the physical and mental failings of the human race, and this in a clear and concise way. In the matter of terminology, it is true that the general practitioner of ten or more years standing will feel that he has to acquire another language, but the author has carefully explained the unusual words, so that with very little effort the book will be intelligible to all. However, this introduction of new terms is inevitable in connection with a progressive science. The book can be honestly commended, and, indeed should be read by every medical man.

A. G. NICHOLLS

**Post Mortems and Morbid Anatomy.** Theodore Shennan, M.D., F.R.C.S., Professor of Pathology in the University of Aberdeen. Second edition. 664 pages illustrated. Price 25/- net. Messrs. Faber & Gwyer, London, 1927.

This book, as its title indicates, is devoted entirely to post mortem technique and special pathology. It is a very useful book, and especially is it a very suitable work of reference, to be kept at hand in the post mortem room for constant use. It commences with a discussion of post mortem examinations in general and such details as records, equipment, and procedure. In an orderly way

it covers the examination of the external surface of the body, and then proceeds to the detailed examination of the various cavities and organs. The technique of each procedure is first described, and then a complete discussion of the special pathology of the part concerned is given.

This book can be highly recommended for routine use in hospital morgues, especially in smaller hospitals, where pathologists are not available, and general practitioners perform the autopsies for correlation of clinical and pathological findings, and sometimes for medico-legal purposes.

JOHN JAMES OWER

**Practical Otology.** Morris Levine, M.D., Associate Professor of Otology, New York Post-Graduate Medical School and Hospital. 387 pages, 145 engravings and 3 coloured plates. Price \$5.50. Philadelphia, Lea & Febiger, 1927.

This little book of 387 pages, entitled "Practical Otology," represents, as the author states, a compilation of his lectures on otology given at the New York Post-Graduate Medical School and Hospital during the past twelve years. It is not a textbook on otology, but is rather a personal statement of conditions as found by the author, and of his methods of combating them.

The author lays great stress on the general condition of the patient. This fact impresses one in reading the text. The anatomy and the physiology of the ear occupy the first two chapters. The cause of ear disease in general is dealt with briefly. Examination of the patient including the special functional examination of the hearing and equilibratory apparatus occupies the next two chapters; the subject matter in both is very carefully described. Laboratory tests that aid in the diagnosis and management of ear conditions together with general therapeutic measures in otology occupy the next two chapters. The diagnosis and treatment of the various conditions have received careful consideration, and the operations advised are those in which the author has had personal experience. The last chapter deals briefly with tumours of the acoustic nerves. Altogether, the facts are placed in a concise manner, and form a very useful little book for the student, the general practitioner, or the specialist.

A. CAMPBELL

#### BOOKS AND PAMPHLETS RECEIVED

We have received the following publications within the last month:

Clinical differences in Tuberculosis; the 1926 Herman M. Biggs Memorial Tuberculosis Lecture by S. Lyle Cummins, C.B.

An Improved Apparatus for Testing the Activity of Drugs on the Isolated Uterus (second paper) by Paul S. Pittenger.

The Ophthalmic Year Book, vol. xxiii. Edited by William H. Crisp and others. 338 pages. Published by the Ophthalmic Publishing Co., Chicago, 1927.

This volume contains the usual complete bibliographies, digests and indexes of the literature of ophthalmology for the year 1926.

Clinics: International Clinics. Edited by Henry W. Cattell, A.M., M.D., and others. Vol. iv, 37th series. Price \$3.00 for one volume; \$12.00 for set of four. J. B. Lippincott Co., Montreal, 1927.

We notice in this number an interesting paper on capillaroscopy by Dr. S. Bettmann of Heidelberg.

Medical Clinics of North America, vol. ii, No. 3. Tulane University number. Philadelphia and London: W. B. Saunders Co. Toronto: McAinsh & Co., 1927.

This volume opens with papers on measles and scarlet fever by the Drs. Musser and Duval.

Surgical Clinics of North America, vol. vii, No. 5. Pacific Coast Surgical Association number. October, 1927. Philadelphia and London: W. B. Saunders Co. Toronto: McAinsh & Co.

This volume is dedicated to Lord Lister, and the opening paper is on "Lord Lister and the Renaissance of Surgery."

Histology. Catechism series. Second edition. 80 pages. Price 50c. Macmillan Co. of Canada, Toronto, 1927.